Vol. VII. MARCH, 1917. No. 3.

MAR 29 1917

AMERICAN JOURNAL of PUBLIC HEALTH

THE JOURNAL OF THE AMERICAN PUBLIC HEALTH ASSOCIATION

Edited by
SELSKAR M. GUNN

A Program of Public Health for Cities
W. C. Rucker, M. D.

A Program of Public Health for Towns, Villages, and Rural Communities
Gustav F. Ruediger, M. D.

Health Administration on the District Plan
Alfred E. Shipley, M. D.

A SYMPOSIUM ON INDUSTRIAL HYGIENE

Published Monthly at
10 DEPOT STREET, CONCORD, N. H.

Editorial Office
126 Massachusetts Ave., Boston, Mass.

Entered as Second Class Matter at the Post Office at Concord, N. H.

AMERICAN PUBLIC HEALTH ASSOCIATION, ANNUAL MEETING, NEW ORLEANS, LA., DECEMBER 4-7, 1917.

YOUR LABORATORY SUPPLIES

CHEMICALS

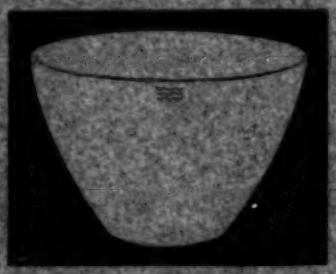
The 1917 Chemical Blue Book is the most complete reference book on chemicals and reagents; it contains 121 pages, 4000 different items, synonyms, formulae, 1500 Kahlbaum's reagents with both German and English names.

We supply each of our patrons with a copy free.

Our stock of chemicals is one of the most complete in the world at the present time and we got it by sending an officer of our company to Europe.

C.A.F. KAHLBAUM G.M.B.H. ADLERSHOF
SCIENTIFIC MATERIALS CO.

PORCELAIN



ROYAL COPENHAGEN Danish porcelain is the finest European chemical porcelain obtainable today.

COORS is considered the best American porcelain produced at present.

We have both these makes in stock and have just issued a booklet on chemical porcelain describing them, copy of which you may have for the asking.

GLASSWARE

FRY RESISTANCE GLASSWARE is not the cheapest nor the most expensive in the beginning, but it's one of the most satisfactory and least expensive in the long-run.

We also stock Nonsol and Pyrex glass, and our glassware booklet shows the factory prices at which we ship these three brands.

RUBBER TUBING

SCIMATCO TUBING is acid cured, jet black, more elastic, stronger, and lasts longer. A sample from us will prove it.

SCIENTIFIC MATERIALS CO., Pittsburgh, Pa.

American Journal of Public Health
Official Monthly Publication of the American Public Health Association
Vol. VII MARCH, 1917 No. 3

A PROGRAM OF PUBLIC HEALTH FOR CITIES.

ASSISTANT SURGEON GENERAL W. C. RUCKER, M. D., M. S., GR. P. H.,
United States Public Health Service, Washington, D. C.

Read before the Public Health Administration Section of the American Public Health Association, Cincinnati, Ohio, October 24, 1916.

CONSIDERED in its broadest sense, the ultimate reason for cities is public health. Every other reason for which mankind collects itself into more or less permanent aggregations is subsidiary to the basic idea of community protection and betterment of every sort. This protection is external, against the outside world, and internal, each individual against the entire collection of individuals. Since every action which produces a betterment of the conditions under which the community lives and works gives a definite reaction in increased health, it is at once seen that a public health program for cities is in reality nothing more or less than a complete plan for communal existence.

The collection of individuals into communities without the direct interposition of health protective measures is possible up to the biological limit of individuals per acre. The moment that concentration is increased beyond this point there is increased opportunity for promiscuity with a coincident intercommunication of disease and reduction of the acreage ratio below the biological limit. Therefore, in order that mankind may dwell in a concentration greater than the biological limit, it is necessary that artificial safeguards be thrown about him.

These safeguards take the form of those general community measures which must be exercised by the entire machinery of city government and those special measures which are exercised by health departments. Of the two, those exercised by the community machinery as a whole are of far greater importance. Health departments, for the most part, operate in end results. Under the present system disease must appear before it can be attacked, the municipal policy being one of eradication rather than prevention. This is to be expected in cities which maintain fire departments for the purpose of extinguishing fires rather than to prevent them, and under this system it would be more logical to call the health department the disease

department. Until there is a basic change, health departments can do little more than scratch the surface of disease prevention because their authority deals with the actualities rather than with the potentialities of disease.

The entire community machinery by coöperation, on the other hand, possesses power to strike health hazards at their very root, to throttle at their inception those elements of municipal life which are the great producers of sickness, misery, inefficiency and premature death. Furthermore, it is possible in this way to create and follow out a definite community policy of which health shall be a basic part. Heretofore, the protection of health has been considered as a function residing wholly in the health department as though health did not as vitally concern the other departments of the city government. The public health program of the future embraces the coördination of the entire municipal machinery and the cooperation of the whole community.

Unfortunately, health has been considered in the past solely as a medical problem and the pendulum has been enthusiastically swung so far that health is almost regarded as an artificial state to be achieved and maintained solely through the interposition of medical safeguards. With entire consistence the health wardenship of cities has been committed solely to physicians, those who by training have been taught to consider the pathological in human life, the symptomatology and evidences of disease rather than the great, basic, underlying, essential factors which enter into and are the vital part in the creation, spread, and perpetuation of sickness. Expert knowledge of disease is absolutely necessary for the work of health departments, but cannot be the foundation of a broad municipal health policy. Public health is something more than a mere absence of disease. It is the physiological functionation of the community.

From the foregoing it may be deduced that the first and most important thing in a public health program for cities is a definite municipal public health policy which shall embrace every department of the city government. In order that such a plan may be put into operation it is necessary that there be a central focus which shall receive impulses from all of the departments and radiate them to the points where they will react with the greatest benefit to the public health. This is in effect the creation of public health centre in the city's brain. If we are to expect active interdepartmental coöperation it is necessary that all of the departments shall be in close touch and that there shall be a medium whereby they can communicate. More than this, if we are to expect the mass of the citizenship to join in this coöperation, there must be some means whereby this shall be achieved.

The keyword in this public health policy is coöperation, coöperation having as its basis the full recognition of the fact that in its last analysis the health problem is an economic problem and as such cannot be solved without careful consideration of the economics of the community. There has been

a great deal said about the purchasability of health. This pleasing catchword has generally been interpreted as meaning that if the general public would give sufficient funds to the health department it would receive health in exchange. Used in this way, the phrase is incorrect because physical health can no more be purchased than spiritual health, and in both, coöperation is a prerequisite to salvation. If we consider that health is purchasable by the full pay envelope whose contents are outlaid for proper food, clothing, housing, and all that goes with them, then indeed is public health purchasable, but this requires the coöperation of the city and its citizens, the aim of this coöperation being the prevention of the shrinkage in the purchasing power of the contents of the pay envelope.

The heart of the program lies in the central coöperating focus. The details of the program will adjust themselves without friction if this point be well determined. This comprehends both the office and the man. The office must be removed from politics; its compensation should be sufficient to render its holder above influence; its tenure should be indefinite; it should have both executive and advisory functions, its advisory functions touching every part of the judicial, legislative and executive functions of the city government. In this way the courts, in making decisions fixing precedents having a bearing upon health, can and should receive expert advice. No legislation should be enacted by the city council without the advice of its health coördinating focus. To it the executive branches of the city government should refer all plans and matters of policy in order that all may be integrated for health. The direct and indirect authority vested in this office is great and far-reaching.

The man to fill this office must be many-sided and he must be able to view health with a broad angle vision, realizing that his duties are not only to keep an entire municipality from being sick, but what is of infinitely greater importance, to keep the body politic in such a condition that its functionation is at the highest degree of physiological efficiency. He must be able to visualize the fact that the least common denominator of health is the purchasing power of a day's labor. His type of mind should be that which characterizes the presidents of the great universities, a combination of catholicity of mental development with creative imagination.

This officer should be the health commissioner; the central coöperating focus should be the health department. Not the health commissioner as we know him now; not the health department as it exists today; but a health department enlarged and expanded in power to such an extent that it can and should be able to reach out and touch the every activity of the city government and harmonize the whole for the increase of health. Health departments nowadays err in one of two directions; either they undertake to absorb and control executive functions which are not properly theirs, for example, plumbing inspection, garbage destruction and the like, or they try to limit their activities to such

a narrow field that they confine their radius of action to the actualities of disease. The president of a great university does not and should not undertake the teaching of the technicalities of Greek, but he should be able to mold it into the curriculum so as to create healthy-minded education. In the same way, the health commissioner need not and should not be responsible for the operation of water filtration plants but he should be able to assemble them into the city's health machinery.

Since concentration is inversely as the transportation facilities, the health department should be the first to be consulted in any plans for the increase of rapid transit. All of the problems connected with streets, with housing, industrial conditions, playgrounds, parks, schools, all of these bear an intimate relation to health and as such should come within the purview of the health commissioner. The police, now almost solely occupied in the prevention of crime and the maintenance of peace, should be a powerful agency for health. In fact, there is no branch of the city government which cannot and should not be coördinated into the health program.

In a fifteen-minute paper it is impossible to even mention the multiplicity of details which must enter into the carrying out of a public health program for cities. More than this, it is not desirable even if time sufficed. The extent to which the influence of a given agency shall reach is directly dependent upon the mental caliber of its directing head, in other words, upon the fundamental idea from which springs the entire train of thought and all the ramifications thereof. The essential element in a public health program for cities is a definite public health policy which shall bring the health agency into close touch with every activity of communal existence. Not a policy which endeavors alone to prevent those diseases which are caused by vegetable and animal parasites, but one which aims at the control of that greater body of destructive agencies, human parasites. Not a policy which tries to control the insanitary tenement yet leaves out of consideration the cupidity which fixes its rent, but a public health policy which shall embrace the entire political economy of disease, a policy which shall be as broad and far reaching as human nature, since after all, human nature is the groundwork from which arises the fabric of the public health.

DISCUSSION.

Dr. J. N. Hurty, *of Indianapolis, Ind.:* Mr. Chairman and Gentlemen: I know you will all agree that we have listened to a very broad and comprehensive presentation of this subject. It has been treated by principle, generally touching upon the detail a little later. I do not know that a municipal organization is solely and entirely for the public health, but I do think that it is solely and entirely for justice. Justice is at the bottom of all things. If justice is accorded, then all other good things will follow. Lieber, in his "Political Methods"—and I am no lawyer, but I understand it is a very great and authoritative work—says that the sole object of government is justice. Other writers say that the sole object of government is justice and order, but he

says that justice includes order and includes all the other features and characters that we care to incorporate into government. Then of course public health is included. Under the head of justice comes even the building of streets and the building of sewers and all of the activities that one can think of, as order, fire, health, etc. Now there is one thing above all else that we do not want to introduce into public health affairs in conjunction with justice, and that is business. We hear everywhere "Let us have a business administration," "Let us do this in a business way." I am fully convinced that we do not want a particle of business about government, not a particle, because business is for profit and government is for justice and the minute you introduce business into government you introduce profit and there is your corruption, and as long as we have that fundamental idea that business covers and includes all of the economies, we will insist upon business and then we will have this horrible corruption which exists in every municipality of the United States. You know corruption is the disgrace of America, and I do believe, it largely, if not entirely, comes out of the idea that we want to do things in a business way, that is, for profit. We do not build sewers for profit; we build them economically and honestly, or should; we build them for a public utility. Justice to the people demands it. Individuals cannot build sewers, therefore the community must do it and it is justice to the community, a very broad view, without question. Of course the organization of a public health department has much to do with the general problem. That is necessarily so, and Doctor Rucker called attention to the fact that at the present time we are dealing with an end product; that is what they say in regard to insanity; for insanity is an end product. We do not take hold of it until the person is insane; then we build palaces in parks to take care of the poor who generally get there by dissipation and incontinence, sexual incontinence, syphilis, etc. We deal with an end product. If we are to have the right kind of health organization, we must deal with the causes of things, not an end product; therefore I would say that hospitals ought not to be under the charge of health departments at all, it ruins the health departments. Their great work is to take hold of the causes of things. If we are going to do anything with insanity, it is not the idea of public health science to build asylums; that belongs to another branch; we have to do it, have to take care of them; there is no doubt, but again I say public health removes the causes of the thing; we have got to fight syphilis, we have got to fight alcohol and all manner of self-indulgences and false ambitions, and we also must fight the degenerative causes of heredity.

Dr. C. St. Clair Drake, *of Springfield, Ill:* There is no question as to the great benefits which would come to the community if the health department and the health commissioner could assume the parts in municipal affairs suggested for them in Doctor Rucker's program. There is hardly a phase of government which has not its public health angle and, if every move of the municipal machinery could be reviewed by the many-sided health commissioner of "catholicity of mental development and creative imagination," possibilities of health promotion would be brought to light which are not dreamed of today. A great deal could unquestionably be accomplished if the health department were permitted to pass upon each step in public work to determine its sanitary soundness, as the law department now passes upon public acts to determine their legal soundness.

I do not want to give the impression that I regard Doctor Rucker's program as over-idealistic. The rapid strides of public health and the increasing recognition of sanitation in governmental affairs, places the realization of the program well within the range of probability. And yet, I think we all realize that such a program would require a very unusual and very radical readjustment of municipal affairs.

In most American cities—far from being the ruling power—the health department is regarded by the administration and by the people as being one of minor importance. As a rule the water department, the department of sewage disposal and garbage disposal, the department of buildings and such departments as streets and alleys are frequently looked upon as being infinitely more important. Although these departments have a very definite public health side—some of them having the conservation of health as the only justification for their existence—the health department is given no voice whatsoever in their

conduct and to be heard in the affairs of these departments, the health commissioner must excuse his opinions on the ground that there is an unusual prevalence of disease or some other unusual health condition.

To transport the health department of the average city to the exalted place suggested for it by Doctor Rucker would seem impossible were it not for the progress which has been made in some communities within the past few years. To accomplish this great transformation will require added years of painstaking education of the people as to the real importance of health conservation in the scheme of community life.

The suggestion made by Doctor Rucker that such executive functions as plumbing inspection and garbage disposal be removed from the province of the health department, is quite necessary to the fulfillment of the program. A health department conducting bureaus of definite public work necessarily finds itself in a position of competition with other departments performing similar functions. So long as the health department is engaged in the practical mechanical operation of such public affairs as garbage disposal, it cannot expect to attain unquestioned advisory influence over other departments. A spirit of rivalry is almost inevitable between departments engaged in any way in extensive operative work and requiring large appropriations for such purposes.

The assumption by the health department of certain definite executive functions—such as those cited by Doctor Rucker—naturally leads to the admission that these are the only departments of municipal affairs that have a special public health importance and the other departments are disposed to operate quite independently and to rather resent the supervision or even advisory attitude of the health commissioner or the health department.

We must all agree with Doctor Rucker that in the past public health has been considered as too strictly a medical matter or a physician's problem. We have all come to recognize that efficient health wardenship requires something more than knowledge of the diagnosis and treatment of disease.

The recognition of any new idea almost invariably causes the pendulum of opinion to swing too far and we are now confronted by lay enthusiasts who define the idea that medical training is not at all essential for the health officer and even go so far as to intimate that a medical education is prejudicial rather than otherwise.

Those of us to whom public health administration is no longer a novelty will agree with Doctor Rucker that expert knowledge of disease is absolutely necessary for the work of the health department and that a thorough medical education is the logical foundation upon which must be built the broad qualifications of a competent health officer.

While, as Doctor Rucker says, the time limit on his address permits him to touch only the high spots in a community health program, it seems to me that it would have been well to suggest that a careful study of the individual municipality, in the form of a sanitary or health survey, should precede even the creation of the health department. The sanitary and health requirements of individual communities vary markedly. In one community a certain class of health problems must be given a degree of consideration to which they would not be entitled in another community existing under different conditions. While the health department may be created on certain general lines and according to a certain general plan, the efficiency of the department will be materially increased if it is cut to measure for the individual city, rather than being taken from the shelf ready to wear.

We are all of us speaking today in very broad terms without time for the consideration of detail and I think that we can all subscribe to the general health plan which contemplates the thoroughly competent health commissioner, supported by his organization of experts, freed from the responsibility of unnecessary executive functions and devoting himself in an advisory capacity to all of the departments of municipal government in any way touching directly or indirectly upon the public health. And I believe that we can also subscribe as an addition to that plan, a thoroughgoing inventory of the municipality preparatory to the organization of the health department and preparatory to the outlining of the program for the department's activities.

DR. C. J. HASTINGS, *of Toronto:* Mr. Chairman and Gentlemen: I agree and I do not agree with practically all that has been said. I want to congratulate Doctor Rucker, in the first place, on his paper; I do not think it is any too altruistic; I like to see the man who aims high, because the higher you aim the higher you are going to hit. Now we hear, year after year, the expression, "Well, they are not prepared for this yet," and we hear also complaints about our governments, both federal, local and municipal, and our government authorities for not giving us necessary legislation and not backing us up. Are we not too fond of blaming others? Let us place the blame where it belongs. It belongs, gentlemen, with us; we are the educators. These men are there to give the people what they want and what they demand, and they are only too glad to give it, but we must create a demand and an intelligence in the public on public health matters that will cause them to demand a high efficiency of public health administration, and then we will get it. In regard to the education and fitness for the position of administrator of public health, I do not think we can too strongly emphasize the fact that a medical degree of a high standard is an essential prerequisite for that position. I would go further than that, and I think that a man, in order to administer public health work efficiently, should have at least ten years' practice in medicine. Then he is in a position to know what the public want; what the public require. I was glad to hear what Doctor Rucker had to say in regard to physical fitness. Many of us have, I hope, long since swept aside such duties as plumbing inspection and garbage disposal and collection (such work as that has nothing to do with the department of health), and also sewage disposal and water purification. The expense in the construction of these is purely an engineering job, but it is up to the department of health to determine the efficiency of these and demand that that efficiency is reached, and we have got to see, also, that we are not burdened by having this charged up to the public health administration. Doctor Hurty spoke in regard to hospitals and said that the department of public health should not have anything to do with hospitals. I think there is an exception to that—the hospitals for communicable diseases, inasmuch as the quarantining and hospitalizing of communicable diseases very materially aids in our controlling these diseases. Therefore, it is essential, I feel, that hospitals for communicable diseases should be under the control of the department of health. However, after we have controlled communicable diseases, we have only done a fractional part of the public health administration. There are many diseases preventable and postponable that are not communicable, and these are as essentially our duties as the control of the communicable diseases. We are not only here to prolong and save human life, but to obtain the highest degree of efficiency while life lasts, and in order to do that, we have got to get way back to the origin ,the social problem in the home. We only too often find that, when we get back into the home from which we have taken a person suffering from some disease, to a hospital, there is a social problem there that has to be dealt with—that the man is probably out of work and that the mother and wife has to become the breadwinner, and thereby there is a double injustice dealt to that family: the revenue of the home is cut in two and those little children are deprived of the care of that mother in their tender years when they most require it. Therefore, we have to see that it is possible for those people to live in a sanitary condition; we have to see that the revenue of that home is such as to enable those people to be properly nourished and housed, and until we do that and solve these social problems; until we see, as Doctor Rucker pointed out, that the owner of the tenement is not exacting an undue rent, that he is not filling his coffers with blood money, that is essentially a part of our duties, that is what I mean by the social problems of public health.

DR. E. C. LEVY, *of Richmond:* Doctor Rucker's paper is an unusual one. He has put before us an ideal, and I imagine that he himself does not feel that this ideal will be fully attained —certainly not in the life of even the youngest here present. But it is always a fine thing to have ideals, to aim high, even though we lose our hatchet.

In working to that ideal, there are many things we should bear in mind. If the health officer of a municipality is to be a man so many-sided as Doctor Rucker has described, it seems to me that we are going to encounter certain difficulties. As

soon as a man is related, in the nature of his service, to so many and such varied activities, we can certainly not expect him to be an expert in all those activities. It therefore would seem, after all, that the end to which Doctor Rucker is working is that of having a city manager and of having that city manager take first into account the health aspect of all problems in the community. For a man to be as broad as all this would mean that he could be scarcely more than an expert executive, who would have to get expert opinions from those under him in each of these various activities. But in this case he would not really be a health officer at all. This would appear to me to be the chief difficulty of Doctor Rucker's program. However, as Doctor Rucker and others will present the working details, it will be interesting to see just how the special difficulty to which I have referred is to be handled. I have to confess that Doctor Rucker had a few sentences in his paper which I could not quite understand, myself; therefore I hope I am puzzling him a bit.

There is no question but that every activity of a community and of every individual in every community has a health aspect, but in remembering this fact, we must also remember that health, while the most important thing, is not the only thing and that we cannot spend all our money for it. The idea of correlating the work of all departments and of coming to the health officer and getting from him advice in connection with each of them is a thing to which we may all work, though we will never, I am afraid, live to see fully realized all that Doctor Rucker has put before us.

Dr. George C. Ruhland, *of Milwaukee:* Those of us who are in public health work and who realize that the problems, especially in America, are rather pressing for a solution of the disquieting observation that life for us is shorter than it is for our European cousins, it is apparent that we must do something to prolong human life. To my way of thinking the problem we have to solve therefore is, how are we going to do it? Each worker in the field of public health undoubtedly has his own methods by which he means to attain this particular point. During the twelve years that I have been devoting my time exclusively to public health work, my thoughts have centered upon one thought through which I hope to get nearer to this solution.

At the present time I believe that the way in which we can get nearer to the solution of the problem is through publicity. If I had to work with only one agency to attain this point, I would ask for a full and overflowing measure of publicity.

As Osler has said, what we need is teaching, not in disease but in health. He says this teaching should be popular—directed to the public. From my observation and contact with the medical profession, I think, however, that the medical profession, above all, is in need of such teaching. I think it is very discouraging, and one of our greatest handicaps, that the rank and file of the medical profession has no understanding and very little sympathy with the public health officer whose activities they consider largely an infringement upon and an interference with their private practice. The moment we want to force through some problem of preventive medicine, they believe that it is taking away from them their bread and butter. Unless we can make them see the difference in public health work, get them to change their viewpoint, to the Chinese system, if you please, of paying a doctor only so long as you are well, we will have this opposition to meet. So, to gain our point, we must educate the medical profession and must also, of course get the public to understand our problems, and then will be forthcoming the financial as well as the moral support, which I believe this problem requires.

Dr. Henry F. Vaughan, *of Detroit:* Mr. Chairman, I think you might just as well have left the "doctor" off, because I feel rather like a stranger here. I am a sanitary engineer and not a real doctor. Doctor Rucker has stated that health in the past has been considered solely a medical problem, as an artificial state to be achieved and maintained solely through the interposition of medical safeguards. It seems to me that there are undoubtedly many phases of public health administration which can be handled more effectively and more efficiently by the business man, by the engineer or by others. At first it would seem that there is very little close connection between infant mortality and engineering, but I think a simple examination of

these activities will show a very close relationship. It is the usual custom, I believe, in most large cities in assigning work to tuberculosis nurses, contagious disease nurses, infant welfare nurses and others, to divide the city into a number of districts and assign one to each nurse or inspector. This system was abandoned in Detroit three years ago and the unit system was adopted in its place. We divided the city into 600 small districts, and made city maps which were blue-printed and on which appeared nothing but the district boundaries and numbers, no street numbers or street names. Street index cards are used for the rapid location on these maps of all births, deaths, insanitary conditions and other matters that pertain to the public health. We have done away with the old-fashioned pin map, which was never satisfactory, and substituted in its place a system of permanent records, each being comparable with the other, and a compilation of which gives us an index to the city's health. The number of births and deaths under 1 year for each year, and the corresponding infant mortality rate is computed for each one of these small districts. A nurse's district is then built up of as many of these bad units as she can conveniently handle. The bad units are those in which the infant mortality rate is above the city average. The nurse visits only those sections of the city in which her efforts are most needed, eliminating in this way many square miles of territory in which her work would be of practically no value. As a result of this intensive method in typically bad districts, the infant mortality rate there has been reduced from 201 to less than 90 per thousand births. The same general procedure has been applied to our work in tuberculosis, contagious diseases, housing and other inspection work, and we can now readily assure the City Council that they will receive a just return for every cent spent in this manner. We go so far as to appear before the Common Council and state that for a given expenditure for nurses in certain specified blocks in the coming fiscal year, we will save a certain definite number of lives.

Dr. J. S. Neff, *of Philadelphia:* I thoroughly agree with the paper in every way and hope to live to see many of these ideals attained. I have only one criticism, and that is I think the author is too severe on the conduct of public health officials in most of our municipalities, and I seriously object to his statement that instead of "public health departments" these should be called "public disease departments." Many of our municipalities have done admirable work in preventive medicine; in medical school inspection; for example, they not only diagnose and exclude children with communicable diseases, but examine every school child, detect and have remedied physical defects. Child hygiene departments see that proper food is supplied, teach the mother how to prepare it, as well as take care of sick children. Prenatal work, done so well in the past few years, in many cities, is of the highest order of preventive activities. I also call attention to the betterment of the milk supply; there is hardly a city of any size in the United States whose health authorities do not control the milk supply from the dairy farm to the consumer, and require its pasteurization in such manner to prevent the spread of disease. There are many other examples of preventive work that could be cited if time did permit. We have many shortcomings and fall far short of the ideals as elucidated in this paper, but at the same time, I do not like the hypercriticism of the "poor work" of municipal health officers.

Doctor Rucker: I want to thank those gentlemen who have discussed this paper for doing exactly what I expected them to do. This paper was intended as an irritant; it was expected to get under the skins of a good many people; it was intended solely for the purpose of making people think, and I think that we have had a little bit of thought this morning. The main point that has been brought out in the discussion is the fact that this program is idealistic. Every program that is going to get anywhere must be idealistic and we must work with that idea in view, remembering that at the end of three years' work, Mohammed had just exactly 13 converts, yet he was able, because he had a great big live human idea, to create a religion which now embraces more people than any other religion in the world. Now we have a religion of the sacredness of man's body, and I think that our ideals cannot be too high in this regard. The reason that we have not, in the past, attained the major position which we should, the reason why the other departments of the cities

and the people themselves consider us of minor importance, is the fact that we have been thinking in nickels when we should be thinking in terms of a million; we have taken ourselves at too small a value; we have placed our aims and our ideals on too low a plane. We should take the position that our work is the important thing upon which rests the success of all of the other activities of communal existence, because health is the starting point of success in community life. We should remember that we are now emerging from the stage of individualism into the stage of collectivism and that as such, we as health wardens, must reach out and touch every activity of the community. I am sorry if I have hurt anyone's sensibilities by speaking of the "disease department," but I ask you if there is not a great deal of truth in that? Perhaps not an entire truth, but at any rate, it is a part of a truth. I am sorry that Doctor Levy did not understand all my sentences. As a matter of fact, I didn't understand them myself, but they sounded so nice I just had to put them in.

THE IMPORTANCE OF UNIFORM CULTURE MEDIA IN THE BACTERIOLOGICAL EXAMINATION OF DISINFECTANTS.

Abstract of paper entitled, "The Importance of Uniform Culture Media in the Bacteriological Examination of Disinfectants," by J. H. Wright, read at the meeting of the Laboratory Section, American Public Health Association, at Cincinnati, Ohio, October 27, 1916.*

Careful analysis of large numbers of determinations of phenol coefficiencies upon many different disinfectants has led the writer to believe that the great majority of the discrepancies obtained in such tests are due to variations in culture media. A long series of experiments has been performed to determine the cause of these variations. These experiments have included a study of the uniformity of Witte's peptone, Liebig's extract of meat, and particularly the study of the influence of the hydrogen ion concentration of culture media upon the resistance of B. typhosus to the action of disinfectants.

So far as the writer's experience is concerned there is no evidence of a lack of uniformity in Witte's peptone. Liebig's extract of meat, however, should be regarded with suspicion.

The greater part of the difficulty undoubtedly lies in our present methods of adjusting acidity, which give, even under the best conditions, large variations in hydrogen ion concentration. It is shown that there is a very distinct relationship between the resistance of the test organism and the hydrogen ion concentration of the culture medium in which it is grown.

It is recommended that for the standardization of disinfectants the following medium be employed: 10 grams of Witte's peptone, 3 grams of Liebig's extract of meat, and 5 grams of salt, with no adjustment of the acidity. This is shown to have a hydrogen ion concentration most favorable for the normal development of B. typhosus.

A careful study of various American brands of peptones was also made, with the purpose of ascertaining, if possible, their availability for standardization purposes.

* To be published in full in the *Journal of Bacteriology* for July, 1917.

A PROGRAM OF PUBLIC HEALTH FOR TOWNS, VILLAGES AND RURAL COMMUNITIES.

GUSTAV F. RUEDIGER, M. D.,
Health Commissioner for LaSalle, Peru and Oglesby, LaSalle, Illinois.

Read before the Public Health Administration Section of the American Public Health Association, Cincinnati, Ohio, October 26, 1916.

THERE appears to be a unanimity of opinon that public health work and sanitation have progressed more rapidly and are farther advanced in our metropolitan districts than in the small cities and villages. In the rural districts the pioneer workers have just begun to make their appearance, but very little constructive work has as yet been performed. In many respects the problems in the cities and those in the towns and villages are alike, but overcrowding in the tenement districts of the former may bring about complications that are not commonly met with in the small towns. On the other hand we have housing conditions in LaSalle and Oglesby that are just as insanitary and overcrowded as are the poorest districts in most of the larger cities.

If the public health problems in the large centers of population are fundamentally not very different from those commonly met with in some of the towns and villages, then let us see why there has been so little progress in the latter as compared with the former. I am convinced that the difficulty is chiefly a financial one. Public health is a purchasable commodity and can be had by any community that is willing to pay the price, but in the small towns and villages that price may be so high as to be almost prohibitive. This is due to the fact that the unit for establishing a more or less independent health department is too small. The population embraced by it is not large enough to support an efficient and properly organized health department. Where is there a town of 1,200 to 1,500 inhabitants, or even of 3,000 to 5,000 inhabitants, that can afford to have a full-time health officer, a school nurse and a food and dairy inspector. No doubt there are communities who could afford to do it if they made up their minds to it, but the cost looms up so big to them that they will not undertake anything, unless it be the appointment of a busy practitioner of medicine to quarantine houses as occasion demands.

It would seem, therefore, that we must enlarge our units for establishing health departments before we can hope to have efficient health administration in the small cities and villages. This no doubt can be successfully done by coöperation of neighboring municipalities as has been done in LaSalle, Peru and Oglesby, Ill. and in Wellesley, Belmont, Needham and Framingham, Mass., but this plan leaves out of consideration the rural communities which most of us are convinced ought to be reached. I have given this matter careful consideration and it appears to me that it is a mistake to separate the small towns and villages

from the country districts surrounding them, in so far as public health administration is concerned. Many of the health problems that confront the small cities and villages are met with almost as frequently in the country surrounding these places and need to be dealt with in precisely the same manner. It is very obvious that a diphtheria bacillus carrier in a country school will do just as much harm as one in a city school and the only proper way to deal with the situation is to find the carrier, by means of throat and nose cultures, and exclude him from school. This, however, is rarely done under the present organization, especially in those states where the country districts are looked after by a county health officer who has to earn his living by practicing medicine, and who may live as far as thirty to forty miles from the school in question.

In Illinois the congressional township is the recognized unit for the establishment of a township high school, and such a high school district may embrace both farming communities, villages and cities up to 100,000 inhabitants. Two or more adjoining townships, or two or more adjoining school districts, whether in the same township or even the same county or not, may unite and establish and maintain a township high school. It has occurred to some of us who have given this matter careful consideration that a similar basis should be adopted and recognized by state law for the establishment of public health districts. Such a district must not be too large in area but should have a population of at least 25,000 to 30,000 people. The congressional township, which is six miles square, is a convenient basis for establishing such public health districts, but in many instances it will be necessary for two or more neighboring townships to combine in order to get the desired population; but in no instance should the district include more than ten congressional townships and these should then be located in a square block. If larger areas are permitted to be used as the unit the distances to be traveled become too great for efficient service.

These public health districts should be presided over by a board of health composed of three or five members. The members of this board may be elected by the people just as the members of the high school board are elected, for periods of three years, but only one, or at most two, should retire each year.* The board should appoint a well trained, full-time health officer, two or three public health nurses, a food and dairy inspector, and if possible a bacteriologist, who could at the same time serve as office attendant. The board must also have power to levy a special tax for the support of this work. If the community is large enough a medical school inspector should be added to the staff. The health officer must be the executive officer of the board and must be given great freedom of action in all matters coming up for his attention. The actions of the health officer must be

*It is feasible also to have the board appointed by the county judge of the county in which the district is situated. In either case, in states under political organization like Illinois, it would be necessary for the people of the district to decide by a vote whether or not such a public health district shall be created.

guided by the state laws and the rules and regulations of the State Board of Health, and also by the city ordinances when dealing with problems within the corporate limits of any city or village in this district. Under this plan, garbage collection, which is a service rendered only to the cities or villages in the district, must be charged up to the streets and alleys department of the city or village getting the service and not to the health department of the district.

The program of activities of such a health department should include the following lines of work:

1. Control of contagious and communicable diseases. The health officer or someone on his staff must visit every house where a case of contagious disease is reported and make a careful investigation into the probable source of infection and the danger of its spread. He must give advice in regard to the disposal of bodily discharges and take all necessary precautions against the spread of the disease. Provisions should be made for isolating the sick in an isolation hospital if the conditions in the home are such that satisfactory isolation cannot be procured. In cases of tuberculosis advice should be given in regard to the diet, rest, sleep, exercise, etc., and especially should the health of the others in the household be safeguarded. Visiting nurses should call upon these patients to give detailed instructions and to see that these instructions are followed. The cases requiring special treatment in a sanitarium should be urged to go to such an institution.

In communities where there is an active anti-tuberculosis society the health department should seek to coöperate with that organization. In LaSalle we have an agreement with the Anti-Tuberculosis Society whereby they and the health department employ a public health nurse jointly. Each of the contracting parties pays half of the salary of the nurse and she devotes half of her time to visiting tuberculous patients and the other half to the schools in Oglesby. She is entirely under the direction of the health department, but also makes monthly reports to the Anti-Tuberculosis Society in so far as that part of the work is concerned.

2. Medical inspection of school children. The health officer should have a working agreement with the different boards of education in his district, including the country districts, under which he acts as the medical inspector of schools and supervises the work of the school nurses. It is a mistake for a small community of less than 50,000 inhabitants to engage a part-time health officer and a part-time school physician. Medical inspection of school children is largely a preventive measure and in the smaller cities and rural districts should be in charge of the health officer. By combining these two offices it will be easier to engage a full-time man, with a decided increase in efficiency of the entire work.

All children should be given a passing inspection on the first day of each term of school. During the term the schools must be visited at frequent intervals by either a school nurse or the health officer for the purpose of investigating any cases of sickness that may exist among the pupils. When

children are absent from school for any unknown cause home calls must be made to determine whether or not they are suffering from a contagious disease. Whenever a case of diphtheria or scarlet fever is found among the pupils, special precautions must be taken by daily inspection or by throat and nose cultures from all contacts.

Once each year the nurse should make a physical examination of every child including tests of vision and hearing and a careful examination of the nose, throat, teeth, nutrition and general cleanliness. All children with ailments requiring the attention of a physician or dentist should be referred to the health officer for verification of the nurse's findings and the parents must then be advised of the necessity of providing proper treatment.

3. Infant welfare work and prenatal instruction. At least one of the public health nurses should give a large part of her time to the health and care of infants. Young mothers and prospective mothers must be given instructions and often demonstrations in the care and feeding of infants.

4. Food and dairy inspection. The food and dairy inspector should make frequent inspections of all grocery stores, meat markets, restaurants, hotel kitchens and dairies, and must collect samples of milk and cream for the bacteriological laboratory. I am convinced that dairy inspection without a bacteriologic control of the milk supplies is bound to fail in getting the best results. This was clearly demonstrated by our experience during the past summer. Our dairies are inspected and scored by a competent veterinarian. Most of them are given fairly good scores, but our bacteriologic analyses of the milk showed that the bacterial counts frequently were above one million per cubic centimeter when the milk was delivered to the retailer. Most of this milk was drawn by a milking machine and a careful investigation by the writer showed that the high bacterial counts were due to improper cleaning and failure to sterilize the teat-cups and tubes of the milking machine. In several instances we got counts of over two million per cubic centimeter, immediately after the milk had been drawn with one of these machines. The teat-cups and tubes were then thoroughly cleansed and scalded and the counts were reduced to less than twenty thousand.

5. Sanitation and abatement of nuisances. Under this head must be considered the insanitary privies, open sewers and cesspools where such exist; the housing problem and many other problems of a similar nature. In communities with 10,000 or more inhabitants the health officer should have the assistance of the sanitary police officer in this work.

6. Publicity and public health education. The health officer and other members of his staff must welcome all opportunities to give public health talks before clubs, societies, parent-teacher associations and other gatherings. Of particular importance in this respect is the work of the school inspector, school nurses and other visiting nurses in the community. Newspaper articles should be written from time to time. By carefully choosing topics that are of more or less general interest locally at the time I find a ready coöperation on the part

of the newspaper editors who will even ask for such articles if they know that they can get them. Some of this work no doubt should be paid for, but a great deal of it the newspapers are willing to accept free of charge.

DISCUSSION.

DR. W. S. RANKIN, *of Raleigh:* I think I will start my discussion with this fundamentsl principle, that, regardless of the size of a unit of health administration, whether it embraces only a thousand or five thousand people *or* five hundred thousand people the successful administration of that health unit demands the knowledge of specialists. For even a thousand or two thousand people, the general man, one man, cannot supply the health needs, cannot meet the sanitary administrative requirements of that unit. To illustrate, I do not think there is a single man in this audience—and I have the highest respect for those who make up this audience, who would make a good whole-time county health officer if that whole-time county health officer had to do *all* of the health work himself, for the reason that there are so many different problems in the county requiring special training. Take, for example, the medical inspection of schools, the examination of dairies, the laboratory work, the periodic examination of adults for common defects (corresponding to the examination of school children for their common defects), one man could do some of those things but not all of them. In other words, the general man cannot supply all the health needs of a community, regardless of its size. How are you going to meet that situation? Doctor Ruediger has suggested one way, take a number of towns or counties and combine them into a health district, and from that aggregation levy a large enough budget to finance a department instead of a single officer; of course the general man must be the head of the department, but give him specialists for handling the different departments; he would have his school inspectors and then somebody else to do the periodic examination of adults, etc. That is the remedy suggested by the speaker, and I am thoroughly in accord with his suggestion, the combining of communities, counties or towns, where it can be brought about, with a view of raising a large enough budget to permit the general supervisor to have enough assistants to give him efficiency in the handling of the special problems of his department.

There is another way; take a county of 15,000 with a town of only 3,000—a truly rural community; go to that county and say: "Here is your total health problem; that is divisible into a number of health units; here for example is your school inspection unit, which is separate from the soil pollution unit; we will make the inspection in accordance with this plan for five or six hundred dollars." The county pays the state and the state puts its man there and does the work; then it will take the tuberculosis problem and other problems in the same way and send different men to do those units. It would not send the man to do medical examinations that would do the school work. That is the method followed in some counties, the division into a number of units, and then the state contracting with the county to handle those different units for a definite sum, according to a definite scheme.

DR. JACOB M. FURSTMAN, *of Lacrosse, Wis.:* There were several points brought out in Doctor Ruediger's paper which I was glad to hear, because the conditions in LaCrosse are practically the same, although LaCrosse is a larger city than Doctor Ruediger included in his program. We feel the need of having it made a county instead of a city department. The city comprises two-thirds of the county of LaCrosse and we encounter a great number of difficulties just outside the city limits. LaCrosse was one of the first cities to get its health department out of politics. We have a board of three members, appointed by the mayor, one new member appointed each year for a term of three years. The health officer, in his tenure of office, is entirely out of control of the Common Council. We are endeavoring to follow out the program Doctor Ruediger suggested, by careful investigation of contagious diseases, medical inspection of schools, dairy and sanitary inspection, infant welfare work, and I am sorry to say that the collection and disposal of garbage is still under

the control of the Health Department. As to school inspection, I wish to say that it is next to impossible to get money from the Council for school nurses. We have had one paid nurse in LaCrosse for six years, and all that the city pays toward her salary is $250 a year; the balance is made up by a tag day and Christmas campaign; but we have, in addition, four nurses; we have a senior nurse whose service is rendered to us from each of the hospitals; a nurse about ready to graduate to do the follow-up work; we all realize that medical inspection of schools without the follow-up work amounts to very little; we have consequently five nurses under the supervision of the Health Department. The least amount of money we could get the services of these nurses for would be $4,800 a year. The city of LaCrosse pays $250 a year for that service. While the nursing service is not ideal, we have been able to increase the attendance in schools to quite a degree. The attendance in the schools in 1910, the latter part of 1910, was 89 per cent.; in the latter part of 1915, it was 97 per cent. While I do not attribute it all to the medical inspection of schools, I think a great share was due to the fact that the children were followed up immediately, when out two days from school, to ascertain whether the child, or any other member of the family, was suffering from any contagious disease. In dairy inspection we have accomplished quite a good deal in the improvement of our dairies, and we have to do that just at times when we can best spare the time. The department consists of the health commissioner and one assistant who does the outside work. There has been discussion of specialists, of one man not being able to do all the work. That is true but we have got to content ourselves with doing all we can in smaller communities until we can educate the public to the value of having a larger force, and in that way obtain better results. In making the Health Department of LaCrosse a county unit its efficiency would undoubtedly be increased. It is difficult for a city centrally located in a county that has a well organized health department with only imaginary lines for its boundary where its jurisdiction ceases, to do the most efficient work as the work in the city and the rest of the county practically dovetails together.

There is no question in my mind but that the sooner the county system of health departments would be adopted the greater the efficiency of public health work would become.

In bringing about this change it is hoped to include the small villages and towns where the work is not only most neglected, but most needed.

DR. L. L. LUMSDEN, *of Washington, D. C.*: Mr. Chairman and Members of the Section: I am not sure that I have clearly in mind just what we are trying to discuss. The program states that the subject is a program of public health for towns, villages and rural communities. It seems that so far the discussion has been directed especially toward health organization in rural communities and much of it has appeared to me to be of a rather idealistic trend. We can miss a target just as thoroughly by shooting over it as we can by shooting under it. I rather prefer, in actual practice, to aim a little low. By so doing we have a chance for the bullet to bounce and hit a leg. It may be well to indulge in discussing these idealistic programs; it is good mental gymnastics, and in time may lead to something practical, but I think it more important, in discussions of these great subjects, for us to aim at something practical, something concrete. We all realize that every rural community should have an adequate health organization. I do not think that any of us are willing to concede that any community is so poor that it cannot adjust itself to some practical scheme to get an adequate health administration, but, as practical health men, we realize that to get a health program started, we must get the people to see the sense in investing their money in health work. I think the crux of this problem is how to get the people "wised up" to the fact that an investment for adequate health work is one of the best dividend-payers that any investment can yield. How to get this "wising-up" started is a considerable question. Most important, I think, is to get some—if only a very little—of our goods delivered for the people's inspection. In this connection I am attracted by Doctor Rankin's unit scheme of work, but I am very much impressed with Doctor Furstman's suggestion that, in order for work so started to be made to stick, we must have someone constantly on the job to keep nursing it along. We need, I believe, in every rural county with a population of over 15,000 a good, wide-awake county health officer, a

full-time man, and MAN spelt with capital letters; a man with a personality, who can get the confidence of the people he is serving. He needs to get the people to believe in him; he needs to get them to believe that his suggestions are practical, common-sense suggestions; but, Mr. Part-time County Health Officer—and you are always with us—what can you do in your little town or rural district to get something started? I make to you this suggestion: Concentrate your efforts to obtain something in the way of a concrete result so that the people will see that something has been done and have a sample of your health goods for inspection. As Doctor Evans suggested, you may, as a starter, get the milk supply improved, or take a favorite old prescription of mine and go after the ragged edges of the town, outside the sewered districts and concentrate your work in getting the sorest of all the sore-spots of the town, the insanitary toilets, put in sanitary condition. I know of nothing else which will give a town or rural community a better start in health work and progress generally than will the sanitation of the unsightly and highly dangerous privies. After the accomplishment of this concrete result the difference in the looks of things is inspiring, and everybody feels better. In a little town in North Carolina last summer this measure was carried out. There were about a thousand people in the town and all of the toilets were insanitary, open toilets. All the privies were made sanitary. About a month after this was done I revisited the town and said to the old hack driver, "How is everything going, Uncle Tom?" He replied, "Oh, the town's booming: we have put in a new barber shop and a moving picture theater, and the town is on the way."

MR. FRANK J. OSBORNE, *of Orange, N. J.*: Mr. Chairman and Members: You have listened this morning to representatives of two ideal schools of public health administration; Doctor Ruediger's plan of health units, health districts, composed of cities, towns or rural districts combined into larger units in order that more finances and a better equipment might be procured; Doctor Rankin's scheme of a group of specialists able and willing to sell their services to smaller towns which are not in position to employ such expert consultants; and both of them seem to me most ideal. We tried the first in the Oranges, a group of five cities of approximating 100,000 population, and three of them very nicely agreed to the scheme which was outlined, but the fourth, the one which happened to be the richest and most influential and powerful, refused, and consequently the whole project fell by the wayside. In the Oranges, however, we have hit upon a system of compromises, and compromising is a very poor general policy because the more you compromise the harder work it is eventually to dig your way out into the ideal, or more perfect scheme. However, in the Oranges we found it most practical to combine, where we could, with private organizations, with the other health departments, with hospitals, etc., to get in part what we had hoped to get in full; and I would like to outline very briefly four specific, concrete instances of coöperative public health combining.

The first came on the crest of the anti-tuberculosis control wave back in 1905 or thereabouts, in which the Anti-tuberculosis League of the Oranges was formed, and about five years later a nurse engaged. She was immediately made a special inspector of each Board of Health with authority to investigate the cases, instruct in the homes and report to the health officers and take care of anything which might, either directly or indirectly, influence that particular problem. Very recently one of the cities has paid a part of this nurse's salary and the eventual aim is to have her completely taken over by the health departments.

In the baby welfare situation up to 1913 there was no definite plan. The Woman's Club had provided a part-time nurse who was attempting to scatter herself over an area of about ten square miles and care for 10,000 families. It was found to be absolutely impractical; but by combining four private organizations with the Orange Health Department and employing three nurses and districting the city into seven baby welfare districts in each of which was a weighing station, a physician and nurse as consultant, we have reduced the infant mortality rate from 135 to 75 in six years.

The milk control work was practically on the same basis. There were 60 dealers selling in five towns, only eleven of which sold in a single town; in other words, forty-nine were more or less duplicating. The dairies, of course, were

more or less common, and it meant that each city was obliged to send to each dairy a separate man, which added to the confusion of the dairyman and also was a drain on the finances of the various cities. The Woman's Club again employed and gave to the Orange Health Department the services of their Field Secretary. She studied the problem, did the laboratory examination for a year, called a mass meeting in the Woman's Club, which is composed of 700 of the most influential women in the Oranges, and finally got that particular combination plan whereby we now have a joint milk inspection service.

Dr. William E. Park, *of Rockford, Ill.:* Doctor Ruediger spoke regarding the financial reasons why the rural districts have been handicapped. I would go back of the financial reasons and place it at the door of lack of publicity and public health education. We know that the larger cities have made greater advances along this line than the smaller communities. Their starting-point was educating the public, and through that education they were able to get better appropriations. Furthermore, in the larger cities, the woman's clubs and other civic organizations are constantly spreading health education among the people, and in the rural districts they are more or less robbed of this support. There has been a great deal said of publicity, and I will just have you reflect on what Doctor Hastings said regarding publicity, which will save my repeating it. Increasing the unit at present I do not believe would be a remedy; at present I believe it would be a little complex. I believe we should have a state minimum per capita; we have it with the game, we have it with parks, we have it with school boards, and still safeguarding the health of the people is not taken with the same serious consideration as with the little fishes. I believe that there should be a standard brought about through the federal government and the states with the small town or village or rural district, where the federal and state authorities might be constantly in touch with them, holding to a uniform standard throughout all the rural districts, as human life is worth as much in one rural district as another. I believe that a board of health would be more satisfactory by appointment rather than by an election; and after all, I believe that this will call for legislative enactment before anything different can be done. Isolation hospitals are more needed or just as much needed in the rural districts as they are in the larger cities, as you must consider you have the milk supply and we all know how many cases of contagious and infectious diseases are traced down to the farm. In many cases where they haven't double facilities, it is impossible for them to have a case of diphtheria and carry on a safe quarantine that will protect their milk supply; while, in a case of that kind, the case could be moved to the isolation hospital and they could go on with the sale of milk after the proper steps have been taken in disinfecting and fumigating the premises. I have noticed in the last few years a great many complaints coming from rural districts, from the townships. They are becoming so that an insanitary neighbor or a dirty neighbor is as objectionable to them almost as in the city; it shows that through publicity the rural districts are clamoring for something better.

Earle B. Phelps, *U. S. Public Health Service:* Doctor Ruediger's work has been followed with especial interest by the present speaker, because it was modelled more or less closely, although under somewhat different conditions, upon the lines of an experimental study of the possibilities of coöperative public health administration which he inaugurated in Massachusetts in the fall of 1912.

It is becoming increasingly evident among public health workers that local health administration in small communities is woefully inefficient and that this weakness, existing at the point of practical application of our accumulated knowledge, presents one of the most important present-day problems in public health administration.

The basic facts of the problem are readily stated. In the report of the Massachusetts work previously alluded to, they were summed up as follows:*

"The local health office in the smaller communities is the most essential and least efficient part of the present-day public health machine. The highly specialized character of public health

*Phelps, Earle B. Coöperative Public Health Administration, An Experiment in Small Communities, Rep. No. 222, U. S. Public Health Reports, Sept. 25, 1914.

work and the financial inability of the smaller community to support a properly trained health organization are in large measure responsible for this condition."

Nor is the remedy far to seek. Obviously, in general terms, it lies in an increase in the size of the administrative unit, as stated in the continuation of the above quotation,

"Consolidation of adjoining communities in a coöperative health office will provide a sufficient population to support the requisite minimum organization for efficient health work at a per capita charge much less than that usually imposed in the larger cities for work of a similar character."

That the events of the past summer have emphasized the importance of these matters in the minds of sanitarians may be inferred from a few quotations that have come to hand within a week.

The New York Department of Health, in its *Health News* for September, 1916, says:

"The pitiable record of suffering, crippling and death caused by the prevailing epidemic of infantile paralysis will not have been wholly a vain sacrifice if the lesson that it is teaching be taken to heart and not soon forgotten, namely, the utter inadequacy of most health districts throughout the state outside of the larger cities to meet great emergencies. This is attributable to factors which are common to all rural health districts and also to those which are peculiar to individual districts. Among the first is the lack of county health organization with provision for concerted and uniform action of all local districts within a county during an emergency, instead of, as at present, the promulgation of a multiplicity of ordinances, rules and regulations often contradictory and enforced to a varying degree with the resulting conflict of authority, ill feeling and reprisals among the different communities, all to the detriment of efficient sanitary methods."

In this same vein, a well-known sanitarian has recently said:*

"When communities are not big enough to maintain a department of epidemiology of the first class, such service should be established for the district or county."

*North, Charles E., M. D. Epidemiology and Preparedness, *Medical Record*, August 12, 1916.

Also, the New Jersey Department of Health in its September, 1916, *Public Health News*, says (p. 45):

"Each township, borough, town, village or city in the state is a sanitary district and is thus a unit for the organization of local health activities. The majority of these units are so small that sufficient funds cannot be provided for adequate public health work by a reasonable rate of taxation. The result is that health work is left undone. The remedy . . . is to enlarge the administrative unit, . . ."

The application of the remedy under various conditions of local and state government demands, and is worthy of, the most serious study, discussion and experiment.

In certain states the necessary legislative authority is already provided for the voluntary consolidation of towns in matters of public health administration, although it may be frankly admitted that these provisions have in the past referred more to economy than to improved efficiency. In other states the county has been adopted as the political unit of health administration while in still others the jurisdiction of the cities may be extended into the surrounding country within a radius fixed by the size of the city itself. Along somewhat different lines the extension of state control is finding favor in certain cases, most notably in New York state, and to a lesser degree in Massachusetts and elsewhere. While the principle of local self-government is, in many of the states, most jealously guarded so that the people would hardly tolerate for the present at least an extension of state control of local public health matters such as has been undertaken in New York, it cannot fail to become increasingly apparent that the extension of the New York idea to its logical limit, the placing of public health administration among those state functions with which the cities and towns have ceased to deal, is worthy of serious discussion.

A principle of democratic government is that each unit from the individual to the state shall be self-governing in those matters which affect that unit and no other, and that where there are matters of common interest among several units the right of self-government exercised by each shall yield to a similar right of a higher unit of all interested groups. Thus the freedom

of action of the individual, his right to self-government, is unrestricted until it comes into conflict with the rights of others. Likewise in the community, self-government is limited to matters of local influence and sharply delimited from matters affecting the general, extra-community, welfare. Interstate interests are in the main vested in the federal government, while the latter in its world relations is not free of the restrictions imposed by international law and world sentiment.

With this principle in mind it will be of interest to see with what other local matters the important subject of public health is now grouped and also what interests have in general been delegated to or assumed by the state. Among the items of purely local control are taxation and appropriation of local funds, the fire and police departments, parks and streets, libraries, public buildings, municipal charities, and matters of a similar nature. Under the partial control of the state are, the borrowing of money, education, building inspection, hospitals, water and sewerage, municipal accounting and similar matters, while the state has, and in general exercises, supreme authority in such matters as food and drug legislation and inspection, the sources and control of water supply, the methods of sewage disposal, the handling and control of epidemics within the state, the higher courts, the regulation of public utilities, banking, insurance and corporations, state hospitals, schools and universities, the licensing of medical practitioners and all other matters affecting the welfare of the people of the state as a whole, and local interference with which lead to confusion and loss of efficiency.

A careful perusal of this list should convince any thoughtful student of this problem that public health administration, as a whole, belongs properly in the last rather than in the first group. No single item in this enumeration is more dependent than is public health upon uniform legislation and efficient expert administration; nor was the experience of the past summer required to demonstrate, as it has so amply done, that in no field is the welfare of one community more dependent upon that of another than in the field of public health. May we not, therefore, confidently look forward to a natural solution of this vexing problem in an extension of state authority and effort and the gradual elimination of the town and village health office with their conflicting codes and procedures, inexpert personnel and notoriously inefficient efforts? In such a consummation the extremes of local self-government and of state jurisdiction would happily meet for the logical outcome of the plan of coöperative health administration, developed in Massachusetts and so ably worked out by Doctor Ruediger in Illinois is statewide coöperation which is but state control by another name.

Dr. H. B. Wood, *of Charleston, W. Va.:* Communities are apt to work cohesively rather than adhesively; this is a point which needs to be considered more by the states. Chesley, of Minnesota, several years ago began the reciprocal notification of diseases. That has been taken up by very few states, apparently; there is an advantage in the state and counties recognizing that beyond their own borders lie other communities. The reciprocal notification between one state and another of the principal communicable diseases and the conditions which exist in the border counties, is of importance and needs to be considered.

To develop the work of a county or town health office it seems advisable to construct a definite seasonal program of work. There is a tendency for health officers and also for communities to work along in public health lines without any fixed idea of relative values and without anticipating what needs to be done. Some health officers, upon assuming office, complain that they do not know what should be done, or what is required of them. A definite printed program of monthly work will help the communities and their officials to appreciate their needs; it will develop particular lines of work when they are needed; it will anticipate the needs and make the work, which is intended to meet these needs, timely, seasonal and effective. A regular program of work keeps the various health officers working in unison upon the same branches of labor, making their activities and their results comparable. The activities, no matter what they are, should be developed each year on time, and should be begun when their need is greatest.

Dr. W. A. Sawyer, *of Sacramento:* I am exceedingly interested in Doctor Ruediger's report, because we have just finished drafting a bill for increasing the size of our local unit for health administration in California. I think Doctor

Ruediger has not aimed too high, but he had in mind too definite a type of community. In the first place, he permits only those communities to band together which have a minimum population of 25,000. This requirement would rule out two-thirds of the communities which we want to benefit by this reorganization. In the original draft of our bill, there was a population limit of 20,000 and I was very glad to be instrumental in striking that out. Then, moreover, he puts a limit on the size of the area of the unit or district. This again excludes from the benefits of the plan the essentially rural communities which need the most attention. In some parts of our state it would take two or three counties to bring together a reasonable unit, and some of our counties, as you may know, are very large in area. I believe we can overcome the obvious difficulties of transportation and give the sparsely settled districts a good public health administration, if we allow counties, as well as small areas, to combine into local health districts and support their health work through taxation. We need to enable communities to establish administrative machinery which will fit their size and population. In planning to meet the problem in our state we are trying to avoid specifying in minute detail just what this unit must be and just what it must do. We have put down one requirement, that they must have a full-time health officer who is a graduate in medicine, sanitary engineering or public health, and has had one year's experience in public health work. If a local unit can afford to employ such a man, no matter how large the area of his jurisdiction would be and no matter how small its population would be, we think the people in the unit deserve the opportunity which would be given by an enabling act permitting them to organize a health department. The state board of health should do all it can to establish as many of these units as possible, and to help the small towns and rural communities to combine to get health protection.

Dr. H. D. Holton, *of Brattleboro, Vt.:* I come from the smallest state in the Union We have a State Board of Health, which consists of three men, and a health officer for each town. So we have about one hundred laymen as local health officers, since there are that number of towns which have no physicians and the law prescribes that the health officer must be a resident of his town.

We have an appropriation of between thirty and forty thousand dollars from the state for supporting the laboratory and the different activities of the board. We have fourteen or fifteen men at work constantly.

We have an inspector who does nothing but go from town to town, as the health officers may call upon him, looking up water supplies, epidemic diseases and investigating general sanitary conditions.

The State Board is in close touch with every town in the state.

Fortunately two years ago we had a gift from an anonymous friend of more than twenty-five thousand dollars for the investigation of infantile paralysis.

We are a rural state, our largest city having less than twenty-five thousand inhabitants and a half dozen more running from eight to fifteen thousand.

The individual members of the board frequently do inspection work, when the regular inspector is not quickly available.

We have two hundred and forty-six health officers in the state and wherever possible we appoint physicians to that office, the central board having full control over the local health officers. We aim to have our local health officers everywhere keep in close touch with the State Board.

If some of the states had more inspectors, they would accomplish more by keeping the central board in close touch with different sections of the state.

Dr. J. N. Hurty, *of Indianapolis, Ind.:* Mr. President, I understood Doctor Ruediger to advocate very strongly health boards. I do not find very much virtue in health boards, but I do find a good deal of opposition in them. The health officer generally is compelled to drag his health board along with him, overcome their inertia, and then, after he has done that, overcome their opposition, and finally he gets there. They are a drag. Just let your thoughts revert to the United States Public Health Service; there they have a surgeon-general commander, no board over him at all, and that service certainly gets there. If the members of the service have any ideas, they must present them to only one man; that man is to lead them; he

gives his whole time to it; his activities are not divided and he produces results. Results have been produced in Chicago that way. I have a board over me, but I haven't the least complaint to make of my board; they have always come my way, and therefore I am not kicking on them; but out in our state, where there are health boards composed of doctors, sometimes a layman is upon them, they are an absolute block, as a rule, and a drag to public health work. I think we would be far better off without health boards unless perhaps, as in New York state, we have a health commission to pass rules and ordinances, but for heaven's sake get a good strong man and just let him alone and he will work out his own salvation.

Dr. R. W. Bell, *of Toronto:* I don't know, I may be repeating perhaps, something said by Doctor Hastings here before, as I have not been present all the time, but from what I have heard from a few of the speakers lately, I would like to give you a short outline of what we do in Ontario. Our Provincial Board corresponds to your State Board, and consists of seven members. The secretary of the Board is permanently employed by the government; the other members are appointed for three years. Under the Provincial Board we have our Local Boards, one for each municipality, one for each city, town, incorporated village or township, numbering something over 800 in the province. The local medical health officers were being continually changed from year to year in smaller municipalities, and there was no continuity; the result was a couple of years ago we made a change by which our local medical health officers are permanently employed and our Health Act requires for them a reasonable salary. The question arose, What is a reasonable salary? What might be reasonable in one locality might not be reasonable in another. We advised that the smaller municipalities pay $100 for the first 1,000 of population and $50 for each subsequent 1,000. In the larger municipalities of 4,000 population and up, the Board consists of five members; in the smaller, of three. Each of these local health officers makes his report to his Board of Health each year and these reports are sent in to us. These Local Boards are under the Provincial Board. Four years ago we had seven inspectors appointed for the province; the province was divided into seven districts. While we have advocated the county system, the legislature will not carry it out; our legislators are afraid that if a full-time salaried officer is appointed, their constituents will rebel against the expense. However, the government divided the province into seven districts and appointed a medical man of years of experience as district health officer. He has seven or eight counties to look after and has a salary of $2,500 a year at the present time, with all traveling expenses paid. He has a good deal of liberty in his own hands, visits from place to place as he finds it necessary or wherever we, of the Provincial Board, deem necessary to send him. In that way we are accomplishing good results, looking after the installation or supervising to some extent the institution of water works systems, sewerage systems and looking after nuisances generally all over the province. Where a local man wants help, one of our district health officers goes to his assistance and in that way we are accomplishing a great deal at the present time. Last year we undertook to supply all the biological requirements for the province free of charge, where we were formerly charging for typhoid vaccine, smallpox vaccine, etc. We got a good grant from our Ontario government, and today we are furnishing to all municipalities free all the biological products required, and as far as Pasteur treatment for babies is concerned, the patients come in and get free treatment. We have furnished in connection with the war a good many hundred thousand units of anti-typhoid vaccine. All the troops that have gone from Canada, three or four hundred thousand, have been treated with typhoid vaccine furnished by the Province of Ontario, and in this way we are doing a work we are proud of.

Dr. Millard Knowlton, *of New Jersey:* I would like to point out that the coöperative work being done in the Oranges, which Mr. Osborne discussed, partakes of the character of the coöperative work described by both Dr. Ruediger and Dr. Rankin, in that it is unit work done on a coöperative basis by the various municipalities, instead of being done by the State Board of Health as in North Carolina. The municipalities combined for milk control, for the venereal disease clinic and for tuberculosis work. I desire also to emphasize the point mentioned by Doctor Sawyer with reference to the size of the unit. It seems to me that it is

rather difficult to have a hard and fast standard for the size of the unit. You will have territory with a population of only three or four to the square mile, and other territory with a population of eighteen or twenty to the square mile, and still other territory in which the population is very much greater. The size of the units must be regulated, it seems to me, with reference to both territory and population, and must, of necessity, vary with reference to the density of the population.

I wish to ask if it is possible to give a numerical rating of relative values in public health work as Doctor Chapin has done in his report on the activities of state boards of health? Is it possible for the committee on the standardization of public health activity, for example, to say that if all lines of public health work be given a total value of 1,000, then contagious disease work is worth 100, vital statistics 100 or 200, or whatever value might be assigned? Is it possible to go through the whole list of legitimate activities for boards of health and give to each a rating of that kind? The activities to be rated vary somewhat with the different kinds of boards. Activities of state boards of health include supervision over local boards, but such supervision is not a function of the local boards. For this reason there must be some variation in rating, depending on the kinds of boards rated. I merely wish to raise the question whether or not it is possible at this time to be so definite as to assign numerical values to the various lines of health work and rate the different health activities on a mathemetical basis?

Doctor Ruediger: I am very grateful to the members of the section for this very free discussion. There is evidence that there are a great many conflicting views on this matter. Some points I want to take up. Answering Doctor Hurty in regard to the objections to the board, I fully realize that there are objections to boards of health, but in order to make this plan a workable one, you must have somebody to appoint the health officer and in the districts I have outlined, we have at present no authority who would appoint this health officer. Moreover, if this health officer were appointed by a single elective officer somewhere, you would have it back into politics, just exactly where we don't want it. So I pointed out in my paper that although this health officer should be appointed by a board, he must be given great freedom of action and must decide many points by himself. I think he should virtually be a health commissioner and decide the points by himself, but there must be an appointive body; moreover, in the scheme that was outlined, this body, which would be the board, must have authority to levy a tax for the carrying on of this work. I do not think it would work to let the health commissioner levy the tax.

We have no council over such an area. Now Doctor Sawyer's point was well taken. I believe that the enabling act must be drawn up in such a way as to be very elastic. I do not believe that the best results can be obtained if the population is extremely small, neither do I think that the best results can be obtained if the area is very large, but in the thinly populated states, it may be necessary to have rather a larger area in order to get the desired population, which perhaps may have to be less than 25,000 as the minimum, as I stated. Another objection was raised, that a board of health by election would not be as good as one by appointment. The difficulty in our plan is that there is no appointing body in the district that was outlined; it can be easily elected. It could be appointed perhaps by the governor, then you would get it back into state politics again. It could perhaps be appointed by the State Board of Health; I do not know whether that would work or not; at any rate, I think you would get it back into politics, no matter whic [w]ay you turned. Legislation no doubt is necessary in order to give the districts authority to establish such a health department. Now the difficulty in getting the coöperation; we have all realized that it is necessary to get some small group of workers in the community busy to point out just what improvements can be obtained, perhaps at the expense of some private agency, before the community will be ready to vote in favor of such a proposition. In answer to Doctor Lumsden's objection that there was no outline of a program of work in my paper I want to point out that most of the paper dealt with the program that such a department should carry out; perhaps the details were not given, but less than half the paper dealt with the organization of the machinery.

HEALTH ADMINISTRATION ON THE DISTRICT PLAN.

ALFRED E. SHIPLEY, M. D.,
Secretary, New York City Department of Health.

Read before the Public Health Administration Section of the American Public Health Association, Cincinnati, Ohio, October 24, 1916.

THE rapid expansion of the public health field during the past few years has resulted in the enlargement of old activities and the inauguration of many new functions. Furthermore, present ideas as to public health obligations differ radically from those of bygone days.

Public health problems heretofore were approached from the viewpoint of police duties, such as the abatement of nuisances and the supervision of infectious diseases when they occurred. This has been replaced by the conception of public health work as preventive and educational in character and the recognition that preventive and educational measures must be applied to the individual to secure effective results. No longer can a town be considered as an abstract proposition; the entire population of the state, city or town must be reached in order to impress upon each inhabitant the fact that community health depends both upon his own health and the relation of his health to those around him.

Old methods of administration do not secure these results and the attempt to modify present procedures to meet new conditions, in many cases, has been much like putting new wine into old bottles. For this reason, experiments have been recently developed in many parts of the country to test out new ways of organizing and administering health work. One of the most promising experiments is the so-called "Health Center," which is now in operation in several of our cities, notably: New York City, Philadelphia, Cincinnati, Dayton, Pittsburgh, Milwaukee, Toronto, Buffalo and Boston.

Fundamentally these experiments aim to coördinate and direct health needs of a given district, the size of the district being dependent upon the ability to influence each inhabitant therein. A local office is established from which to direct its affairs. The field of public health activities covered in these cities varies, but to a great extent has been limited to child welfare, and anti-tuberculosis measures. Milwaukee and Philadelphia have concentrated on Child welfare; Buffalo and Pittsburgh have added anti-tuberculosis work; and Cincinnati has combined tuberculosis work and incidental relief measures. New York City in 1913, through the New York Milk Committee, started a center for coördinating infant welfare activities. In all of these places the experiments have been conducted by civic agencies and not by public health departments of the community. In Cleveland and Dayton, however, the Health Departments have coöperated with the district nursing associations in developing a more generalized nursing

service. The Health Department of Toronto is trying a combination of infant welfare, school, and tuberculosis nursing, while Boston's experiment embraces curative and preventive measures through the bedside and clinic care of the sick, as well as public welfare and tuberculosis work. All of these experiments were restricted to the development of better methods of public health service in a few of its phases only.

It remained for New York City, through its own municipal Health Department, to inaugurate an experiment on a much more comprehensive basis than any heretofore attempted. In 1914, Dr. S. S. Goldwater, then Commissioner of Health, directed the establishment of an experimental health district within which all the functions of the Health Department were to be locally directed. The plan aimed at the avoidance of overlapping by different bureaus or departments concerned with health matters and an increased usefulness through the establishment of intimate neighborly relations between the Department of Health and the local community. The breadth of the experiment is indicated in the endeavor to demonstrate (a) the value of a district plan of health administration with a view to its application to the entire city; (b) the practical value of directing locally, in a combined form, public health activities, such as infant welfare, school medical inspection, supervision of infectious diseases including tuberculosis, sanitary inspection, and public health education; (c) the development of a community spirit with respect to health affairs; (d) the possibility of coöperating with social welfare agencies and general hospitals in establishing a broad preventive health program.

Within the past two or three years the question has been raised as to whether the administration of the Health Department activities is served best through control centralized at general headquarters. The present organization of the Department consists of nine bureaus, each of which plans and performs its own work by means of its own force operating throughout the entire city. Five of these bureaus are concerned with field work: Bureaus of Child Hygiene, Preventable Diseases, Food Inspection, Sanitation, and Public Health Education.

Brief Description of the Experiment.

The experiment is conducted in an area approximating sixty-three acres in twenty-one city blocks and includes a population of about thirty-five thousand, mostly of Russian and Austrian nativity. Field activities of the following bureaus are covered:

Bureau of Child Hygiene	Prenatal work
	Infants' milk stations
	Pre-school examinations
	Midwife and foundling supervision
	School medical inspection
Bureau of Preventable Diseases	Tuberculosis supervision
	Supervision of other infectious diseases
Bureau of Food Inspection	
Bureau of Sanitation	

The staff of the district is as follows:

A health officer in charge
1 medical inspector on part-time service required for the milk station, pre-school examinations and school medical inspections
3 nurses
1 nurse's assistant for the milk station
1 food inspector giving to the district about half a day's service
1 sanitary inspector devoting one to two hours a day to this work
1 clerk

The general principles of "Line-and-Staff" are applied in developing the organization; that is to say, the current routine work is under the direction of the health officer, whose duty it is to see that the work of the district is performed promptly and satisfactorily. The health officer has direct charge of the district staff, which he assigns to duty as he considers best. The staff represented by the bureaus for which the work is being done, sends supervisors into the district to see that the service is being adequately performed.

The district office located in about the center of the area, occupies the basement and first floor of a double five-story tenement house. Three rooms in the basement are used as a milk station; the front one as a conference and clinic room, the second for weighing the babies, and the third as a dressing room. The walls of the front room are covered with photographs selected because of interest to the patrons of the milk station, food dealers, janitors, parents, and to the boys and girls of the district. These photographs are not only those of the Health Department but include contributions from the Department of Street Cleaning, Tenement House Department and Fire Department on matters which concern health activities under their jurisdiction. The first floor has four rooms which are arranged for office and general conference purposes. The walls of these rooms are covered with photographs describing the administrative and scientific phases of the Department, for these quarters are designated for holding conferences between the health officer and various civic workers and organizations of the neighborhood. This floor provides space also for workers coöperating with the Health Department in the experiment, such as inspectors of the Tenement House Department and volunteers from charitable societies.

The district medical inspector by performing school medical inspection work four days in the week, and the service in the milk station the other two days, is able to care for work formerly performed by two medical inspectors in that district.

Three nurses whose work in this area was formerly supervised by three bureaus in general headquarters, now serve under direct district control. During the morning, one nurse is detailed to inspect the infectious disease records; another nurse is assigned to the milk station; while the third is given the school medical inspection work. In the afternoon, all three nurses do the field service, each one being assigned a section of the district. These visits include those to milk station infants, tuberculosis cases and other infectious diseases.

A food inspector gives about three hours of his daily service, as this is sufficient for work of this character in the district.

Very little service is required of the sanitary inspector inasmuch as this district for the most part includes tenement houses, and sanitary inspection of this type of building in New York City comes under the jurisdiction of the Tenement House Department.

A very comprehensive program for public health education has been developed. The publications of the Department, which are for general distribution, have been grouped into appropriate series, such as "Care of the Infant," "The Prevention of Typhoid Fever," "The Value and Need of Vaccination," "How to Care for Food," and similar articles.

At first the literature was distributed indiscriminately, but was modified later to concentration on one special set of pamphlets for each week, thus insuring about fifty different sets to the district inhabitants at the end of the year. These are distributed to patrons of the milk stations, at Boys' and Girls' League meetings, at food dealers' and parents' conferences, janitors' meetings, and to others who may come to the district office. In addition, circulation among the families throughout the district is effected by having the entire field staff leave literature at the homes visited, using the services of the Boys' Leagues, and utilizing the public schools, hospitals and civic organizations as distribution centers. On many occasions, seven to eight thousand pieces of literature on some special subject have been distributed in a few hours through these various channels. A special weekly, entitled *The East Side Chronicle*, is published by our Bureau of Public Health Education for distribution in this particular section of the city.

Under the description of the district office mention has been made of the two exhibits of photographs. In addition to this, a large bulletin board appears on the outside of the building, on which are posted "Health-grams" changed every week by the Bureau of Public Health Education.

Lectures and conferences of a varied character are held. Meetings for mothers are conducted at the milk station, and talks are given by the nurses on the care of the baby. Several Girls' Health Leagues have been organized and meetings are held weekly to receive instruction on health topics.

The Boys' Health League was organized during May. This League is formed on a military basis, with a captain and three lieutenants in charge of each square block. These officers in turn select one boy for each house. Thus is developed a system by which the entire district is well covered for any coöperative Health Department work that the boys may be called upon, and are able, to perform.

The various city departments which direct activities for the conservation of health and sanitation, such as the Tenement House Department, the Department of Street Cleaning, and the Department of Water Supply, coöperate by giving lectures at these

meetings of the boys. This secures one good, strong organization for public health work, and avoids many organizations under different city departments covering practically the same field, which results in diffusion of interest and effort.

Many meetings have been held for special groups of workers, such as food provisioners, confectioners, butchers, milk dealers and others. A series of conferences under the joint direction of this Department and the Tenement House Department, have been given to the janitors, with attendances ranging from 50 to 200. At these meetings, the audience is instructed in the rules and regulations referring to their particular occupations, and their coöperation with the work of the Department is requested.

The general attitude of the Department is that of an instructor, relying upon the people to make their local district one of the healthiest in the city. This local pride has been developed to a marked extent and the results are evident by the lessened number of arrests for violation of food and sanitary regulations. The health district took an active part in the Fourth of July celebration in the neighborhood, the Little Mothers' League, the Boys' Health League and the babies of the milk station being assigned a prominent place in the line of march.

The Educational Alliance, which is located within the boundaries of the district, is coöperating to a marked degree. Its lecture hall is used for a series of lectures to the district people on various health topics as a regular weekly feature, with audiences of 100 to 650 people at a time. In fact, there is hardly any organization interested in health work which has not joined in the constructive program established.

The private physicians who have offices in the district are organized in a Local Physicians' Advisory Committee. The various relief societies and social agencies doing work in the district are banded together as a Local Relief Committee. The volunteer civic worker acts as a clearing house through which the health district field force makes the proper connections with the charitable agencies for necessary relief. Principals of public schools, superintendents of hospitals, directors of social agencies, and local civic workers have consented to help in their respective fields, and are organized as a General Advisory Committee.

Other city departments make the district office their local quarters, and their field force aids in the distribution of our literature; our force in turn distributes their literature concerning health matters. The Police Department has been "hitched on" to this community health program by having the patrolmen visit cases where there have been violations as to sanitary and food conditions and the control of infectious diseases, and in delivering cards of instruction and information with respect to infectious diseases.

Conclusions.

This experimental district has been in operation nearly two years. To those who have participated actively in its administration, the value of

certain features appears to have been demonstrated very clearly:

I. *A Community Spirit can be Aroused.* It is shown that

(a) To the inhabitants of the district the work of the Health Department has become concrete; the district office is recognized as a place to which they can come for guidance in public health matters.

(b) Local civic organizations and public-spirited individuals are ready to aid the Health Department in developing a community health program. Private physicians, relief societies, neighborhood associations, educational alliances, public, parochial, and private schools, all coöperate in improving health conditions.

(c) A systematic health educational campaign by means of appropriate literature, exhibits, lectures and demonstrations will secure the attention of the people. The organization of clubs for boys, girls, parents, janitors, food dealers, et al., provides a very potent means of instruction with respect to health needs and requirements.

II. *Local Administration Gives Improved Service* as evidenced by the following:

(a) The health officer administers his health work to provide for the peculiar needs of the community under his direction. Furthermore, the field force is elastic; that is, it can be concentrated on infant welfare, school, infectious diseases, or other service as conditions or seasons of the year demand.

(b) Many local inter-bureau affairs can be adjusted directly at the district office. This gives a more satisfactory service to the people of the district and avoids the delay involved in referring these matters to general headquarters.

(c) The entire staff develops an interest in, and a knowledge of, the general health of the community. The family as the true unit of health work is emphasized, instead of some particular function, such as, supervision of tuberculosis or the care of the infant. The action and reaction upon all members of the family of deviation from normal health conditions is considered, as well as the relation of the family to its environment. Specialized functional administration limits the perspective of field workers.

(d) Nurses working together in a common field develop greater enthusiasm and interest in health work. Furthermore, nurses can be trained to perform satisfactorily an all-round health service. Upon this point there is a difference of opinion even among the administrative officers of our Department and probably this holds true of the experiments being conducted elsewhere. Unquestionably, concentration upon special functions results in special ability, but it is the opinion of the writer that we have over-specialized and that the amount of special technique lost in general service is more than counterbalanced by the broadening influence incidental to the consideration of all health conditions.

(e) Overlapping of service has been greatly reduced. This is especially apparent in the nursing service, where functions formerly performed by many nurses attached to different bureaus,

are now done by a few nurses, each one being assigned to her own district in which she does all the visiting to the families therein. This has the further advantage of minimizing the annoyance consequent to many visits by many nurses to the same family. The following analysis of nurses' visits made during the first three months of the experiment shows the saving effected:

By staff of 3 nurses—2,280 visits in 1,475 houses.
In 991 houses, 1 health function was served at 1 visit
In 301 houses, 2 health functions were served at 1 visit
In 104 houses, 3 health functions were served at 1 visit
In 44 houses, 4 health functions were served at 1 visit
In 19 houses, 5 health functions were served at 1 visit
In 14 houses, 6 or more health functions were served at 1 visit
1,475—Total

(f) A greater amount of field service can be effected under the present system than under old conditions with the same force.

III. *Departmental Administration on a District Basis if Organized Properly Should Give an Improved Health Service to a Community.* This is true because

(a) Division of a city into districts with a health officer directing the activities of each district permits distribution of service according to local needs. Varying characteristics of different sections of the city, as shown by social distinctions, the nationalities of inhabitants, peculiar customs, type of dwellings, commercial districts and congested quarters demand varying methods of health administration.

(b) The district health officers being controlled through an administrative body at general headquarters are required to conform to policies and methods outlined to insure uniform execution of orders not purely local in character.

(c) Contrasting the district with others as to administration and results provokes health rivalry and acts as an incentive for improvement.

(d) Functional bureaus at headquarters are relieved of a vast number of petty administrative details of a purely local nature, which can be cared for as well through district officers. It thus gives to technical experts at general headquarters time to study and plan more advanced and new methods of administering health activities in their respective fields. Their development and execution can be directed by them through the district administrative officers.

(e) Planning and performance are recognized, as they should be, as separate functions. Planning the health activities is undertaken by qualified experts. The district officers, who should be chosen because of proven administrative ability, see that the work is performed. Too often under present methods of health administration an officer is required to both plan and perform his work, a task too large to secure best results for either function, and, furthermore, a combination of qualifications such as these is not often found in one individual.

(f) The district plan conforms to present tendencies in the field of general organization, to the principles of which we must refer, because health organization has not been recognized yet as a separate problem. The principles of "Line-and-Staff" organization, upon which all modern armies

are based, are receiving increased consideration by industrial corporations and railroads in the administration of their affairs. This is the type of organization described in the health district plan. The members of the general staff are the technical experts who plan the work, and the line organization, performing the routine day-by-day duties, is represented in the district officers, each of whom controls his own force of field workers.

A pure "Line" organization, which is the one in use at present in most health departments, has many disadvantages, among which may be mentioned the tendency to become haphazard and autocratic, the burden of work and responsibility falling upon the field man, with resultant non-organization and great waste of effort. The great dangers in a pure "Staff" or "Functional" organization are bureaucratic administration, over-specialization, and overlapping of service with consequent duplication of effort. A "Line-and-Staff" organization tends to correct these defects.

The original plan of the experiment involved the coöperation of hospitals, dispensaries, relief societies and other agencies concerned with community health in order to develop a broad health program. Some of these features have been tried out but up to the present time the results secured are very incomplete and not sufficiently developed to warrant discussion at this time.

The present Commissioner of Health, Dr. Haven Emerson, has been so impressed with the results secured in the original health district, that he has ordered the extension of the experiment to the entire Borough of Queens, in which four health districts have been started, and plans are under way for applying it to other sections of our city.

DISCUSSION.

Mr. M. N. Baker, *of New York City:* It seems to me that in the majority of our cities and towns, while it is very desirable ultimately to broaden the field of health activities so as to take into account everything that may make for better public health, that for the present we ought to concentrate on those more obvious things, such as the suppression of communicable diseases and the reduction of infant mortality. I was somewhat impressed, in listening to the second of the papers just read, by the fact that, notwithstanding this intensive work which is being done in New York City, after all the greater part of the work outlined relates to these matters of contagious disease and infant mortality, or, to broaden that term, child welfare. What we all need to take into account continually is some measure of the work that we are trying to do and the results that we are accomplishing in terms of the money we are spending and for the present we certainly can do that best in connection with the two lines that I have mentioned. We should not rush forward too hastily in many of these general and broader things which we wish to do as soon as possible.

In regard to the second paper, it occurred to me, as it was being read, that the district plan for city work might, with immense advantage, be extended to apply more generally than it has yet been applied to state work. There is an immense waste due to sending inspectors and officials of one kind and another long distances over the state. In one state that is not very large, the practice has been, until recently, to send three or four different inspectors, only a few days apart, to look up quite similar lines of

work. I think the district idea might be applied very advantageously to state as well as to local work.

DR. J. S. NEFF, *of Philadelphia:* Mr. Chairman, Ladies and Gentlemen: I consider Doctor Shipley's paper, although I may be prejudiced, one of the most important papers presented to this Section, as it must prove a great stimulus for efficiency in public health work. His data concerning Philadelphia are not quite accurate. Efforts had been made by the local health authorities about six years ago to procure budgets sufficient to create health centers along the same lines on which they have already been organized in other cities. Owing to failure in this endeavor, a few years ago, a private organization known as the "Child Federation" made an intensive study of a circumscribed district, established a health center, and maintained it in such a manner to make a practical demonstration to show the necessity of incorporating this character of work with the functions of the municipal department of health. Within the past year that center has practically been turned over to the city government and such has been its success that today, I am glad to say, there are four additional health centers in the city of Philadelphia, run entirely by the Health Department. The facts already deduced have proven, beyond question, that this method of public health administration is beyond the experimental stage, and there is no doubt in the world, from the results already obtained, that this is the ideal method for effective and efficient health administration in cities of large size, say of 200,000 population or over. The cost of maintenance is less under the health district plan than under the old methods, especially if you eliminate the cost of office rent. As the work is so much better done, efficiency increased to such an extent, that the results obtained are much greater. I mention the elimination of office rent for I believe the public school buildings should be used for this purpose. They have been erected at great cost and at present are used but one-quarter of the time. There is one very important phase of our work that has not been alluded to and I am informed is not employed in New York, namely, house to house visitation, irrespective of the existence of reportable disease. We take a district, block by block, and send the nurse into the home. I think it is very important that the nurse should speak the same language as the housewife. The nurse reports to the proper municipal departments, on the general sanitation of the home, the immediate surroundings, and teaches the social conditions, gives instruction on maintenance of hygienic conditions, how to purchase foods of the greatest nutrient value and at the smallest cost and how to prepare it for the table. When it is felt that the people can be relied upon to carry on the methods they have been taught, with occasional supervision, the work proceeds to the adjoining block, and the same method is carried on. This procedure makes the family the unit, complete records of which are kept in the health center through which the general executive health administration is kept in direct touch with every family in the city.

DR. HEMAN SPALDING, *of Chicago:* Mr. Chairman, Ladies and Gentlemen: I have jotted down a few things that I wish to call your attention to without argument. The desire of all health officers to get closer to the people has taken form in this attempt to establish health centers. I think the district plan is an advance in health administration. The plan should be tried in all large cities where the conditions render it feasible. I would have the health stations in a building designed for health work only. If you want to command respect, you must have a building that commands respect. Such a health station should have, first, a room for the display of health posters, spot maps and any other educational exhibits. This room should be used for an assembly room where lectures could be given with lantern slides, and also could be used for teaching little mothers' clubs which are so far-reaching in their effect. Second, a free dispensary should be provided for the treatment of defective children, children who have no means for securing a doctor. Third, a dental clinic should be established in this building for the same purpose. Fourth, the public bath should be located in this building. Fifth, the room for infant welfare should be provided for in this building. In this building we could have incubators for diphtheria cultures, which could be carried from a sub-station to the municipal laboratory. I would have this station under the supervision of a full-time health

officer, who would have under his charge groups of health officers, field and school health officers, field and school nurses. Sanitary health officers, and food inspectors, could meet here also. At the present time in Chicago we have stations of that kind at the police stations, where the sanitary officer and the food officers meet, and, in coöperation with the police, are doing very well. All assignments of work I think should be made from the central office and daily reports of all transactions must be sent from the sub-station to the central office and a carbon copy of such reports retained for the use of the sub-station. This organization will cost more than the present method, and the men who furnish the money must be convinced of its feasibility. They must further be convinced that this plan will bring better results than the present plan. The character of the people will determine the size of the territory served by one station. I should say it would vary from 25,000 to 100,000 people for one station. Our present method does not reach the classes who swell the death-rate; we need a change. I understand we are to discuss Doctor Hastings' paper also, if we have time. Public health work is limited, first, by the amount of money provided for this work; second, by the intolerance of the public to new and advanced ideas; third, it has its natural limitations when the results obtained are of less value than the time and money spent. We must be practical and valuate our activities. Since we cannot put into operation all the schemes which it is known may save life, we must select such activities as will give the greatest results for the least expenditure of money and force.

D. F. E. Fronczak, *of Buffalo:* In relation to the paper, I would like to refer to the health centers in Buffalo, which, I believe, have been developed further than in any other city in the country. The health center is a miniature department of health, established in various parts of the city for the purpose of bringing the activities of the Health Department into intimate relationship with the needs of the people. It is not unlike a sub-station of the post office in relation to the general post office of a city, but with added functions. The first health center in Buffalo was established in 1914, in a district densely populated by some twelve different nationalities. Subsequently, in 1915, for the purpose of perfecting and extending the health center plan, a conference was held with representatives of all the social service working organizations in the city—the Charity Organization Society, the District Nursing Association, Milk Stations, Superintendent of the Poor, etc.—to the end that coöperation and uniformity of procedure between all should pertain, that extension of activities should attend, and that uniformity in keeping records for the prevention of duplication should ensue. I may say these records are now uniform and are exchanged daily.

At the present time, there are four health centers located in the four districts into which the city is divided, and they are located so as to be accessible to the needs of the population in each; and, additionally, there is maintained a central service for venereal disease, tuberculosis infections and mental disease, though within certain limitations this work also finds place in the health centers themselves. Each Buffalo health center is housed in a specially built and arranged building, and the scope of their work includes a well-baby clinic, and sick-baby clinic, a prenatal clinic, eye, ear and nose clinic, skin and throat clinic, free dental dispensary, medical clinic, etc.

I spoke yesterday at a symposium on venereal diseases and referred to the work in this field done by the health centers. Buffalo maintains a urologic hospital with outdoor service and indoor care and treatment, 48 beds—free to the poor—and every procedure in accordance with modern requirements including the Wassermann tests and salvarsan treatments, etc., is provided. The results, both curative and it is believed preventive, are very gratifying.

A supervision of midwives and their deliveries is another feature of great importance that is carried on. Every child in each district delivered by a midwife is visited by a public health nurse, and the condition of the child and the mother investigated, and with especial attention to the liability of ophthalmia neonatorum. During the past year, over 4,000 examinations of children born under these circumstances have been made and 226 children suffering from eye trouble have been either taken to the hospital or taken care of by our specialists in eye diseases without a single case of blindness or impairment

of vision following. This work has attracted wide attention.

The Department's Bureau of Sanitation is engaged in making a complete survey of the city as to housing and relating conditions. One district of 3½ square miles, with a population of 25,000 people, has been completed. In addition to housing conditions, numerous other and surprising disclosures were made. Cases of concealed tuberculosis, venereal disease, insane and feeble-minded, truant children, prostitution, chronic alcoholic and drug addicts and a variety of similar conditions were unearthed, all of which were given prompt attention and have been properly disposed of according to established procedures. A city survey is of the highest importance and affords a basis for initiative work not obtainable otherwise.

Our experience so far shows that the health center plan is the one best adapted for meeting conditions. They bring the Health Department in close touch with the masses and favorable, they exert a desirable influence and reach fundamental conditions, alleviate sickness with promptness and accomplish a vast amount of preventive work not feasible ordinarily.

Doctor Shipley's paper is timely, interesting, and I am glad to have had the opportunity of hearing it.

Dr. J. F. McCrudden, *of Philadelphia:* Doctor Neff was entirely too modest in his discussion, as he neglected to state that he was primarily responsible for the health center movement in Philadelphia. In connection with this work, I have one suggestion to make to those who are about to take up health center work. Doctor Neff spoke of the house-to-house canvass. We have found this to be all important. We believe that in the house-to-house canvass we were enabled to more thoroughly accomplish our work of preventive medicine,—that for which the health center movement was primarily instituted. In Philadelphia, we also give much of our time and attention to a complete census of the neighborhood embracing the health center, and this, too, was of great help and assistance to us.

Another feature which we covered and which has not been spoken of by Doctor Shipley was the effort made to make the health center a community center. In view of the success of the health center proposition, it would seem to me to be only a matter of time when we will attempt through the health center to control the playgrounds and to make use of the schools for community entertaiments for the promulgation of health standards. Health center functions must eventually embrace the entertainment feature in the effort to promote interest in health principles.

Doctor Neff did not have time to state that we also conduct eye and dental clinics at these health centers, and in the one center in which the Child Federation coöperates with the city, we have accomplished extraordinary results.

Dr. G. W. Goler, *of Rochester:* I think there is no question but that the health center has come to stay. I only want to say a word in opposition to a statement made by Doctor Neff in which he says it is important that the nurse, who is the chief factor in health center work, should speak the language of the district in which she is doing her work. I believe it is important that they do not, and I will tell you the reason why. Some years ago, in talking to my friend, Lawrence Veiller, of New York, he said he was putting out a pamphlet and tried to put out as many pamphlets on the subject he was discussing as there were languages spoken in the district, until his funds ran out and it was practically impossible to continue; then he began an investigation and found that he was able to use the children in the various families as interpreters for the nurse. He said that when he went to a family of foreign-speaking citizens, the nurse would go in and what she said would be interpreted to the family through the children and the parents would stand with mouths wide open, and finally, in one case, the father jumped up and said "Ha, finee the boy, speakee the English like hell. Good stuff."

Doctor Shipley: The question was raised by Doctor Neff as to the practicability of the health district idea in relation to state health work. It is my feeling that this type of organization can be applied to both state and municipal health work. Among general organization experts and efficiency engineers, it is the opinion that Line-and-Staff organization is applicable to large communities, such as towns of over 100,000 or in districts covering a large area, such as one of the states. In small towns probably a pure line or a pure staff organization would be preferable.

We have in New York state an organization

in which staff officers directed from Albany travel through their respective districts and instruct the local officers in best methods for performing their work. The line is represented by the local health officers who see that the work is done for their respective districts.

The house-to-house canvass in New York City has been applied to a limited extent so far as it relates to infant welfare work. We have not extended it as a broad proposition for that would require a large staff and with the limited funds allowed by the local municipal authorities, it is not a measure we can pursue at the present moment.

I agree thoroughly with the community center idea; in fact, I foresee its extension to the municipality as a whole. I myself have suggested to New York City municipal officials that eventually all the activities represented in the various municipal departments be segregated into districts and administered by what may be termed "District Mayors."

As a matter of fact, our big cities are overgrown small towns and the people have lost contact with the general affairs and we must turn to the local center idea in order to secure best results.

I am inclined to agree with Doctor Neff rather than with Doctor Goler that it is highly desirable that the nurse should be of the same nativity as the people in the district with whom she is working. That has been the experience in New York City, and Doctor Baker, Director of the Bureau of Child Hygiene, is continually trying to find nurses of the same nationality to go among the Italians and Poles, because we feel that the influence they exercise is much more than it would be through nurses of different nationalities.

VENEREAL DISEASE IN CHRISTIANIA.

It is, perhaps, too much to hope, for the immediate future anyway, that our country will adopt any system of compulsory notification of venereal disease. Perhaps in time a city here and there will adopt it, and upon its success in such progressive communities will depend its extension to the nation at large. If some enthusiasts will brand us as ultraconservative in this matter, at least we have the support of the chief European powers in our attitude. Here and there, however, throughout the civilized world, countries are beginning to adopt measures looking to the safeguarding of their citizens from these insidious and prevalent dangers. Frequently we find the progressive offspring of a conservative parent welcoming such public health measures, as witness Australia. Then, to jump nearly the length of the globe, there is Christiania, which has been reporting venereal diseases since 1876.

In the report of the medical officer of health, Dr. Yngvar Ustvedt, for 1915, there are reported 2,424 new cases of venereal disease. This is more than twice as many as were reported in 1876, but since that year the population of Christiania has more than tripled. In other words, the percentage of venereal disease to the population had fallen from 1.28 to .96. The percentage of syphilis itself has fallen from .53 to .25 per cent. It is not probable, from what we know of lues, that these figures represent an actual decrease in the prevalence of the disease. It is more likely that with the advent of the Wassermann reaction and other diagnostic refinements many cases were definitely decided not to be syphilis, but chancroid or some skin disease. The day has gone by, we hope never to return, when the medical student learned two kinds of skin disease, eczema and syphilis, and every case was certain to be either one or the other.

Doctor Ustvedt's report mentions that during the year seven women were convicted in the courts of knowingly exposing others to the infection. It does not mention how many men were brought to trial who were directly responsible for complete hysterectomies.—*New York Medical Journal*, January 6.

Editorial Section

Selskar M. Gunn, Editor
A. D. Hiller, Assistant
Prescott W. MacNeill, Business Manager

Editorial Assistants
A. W. Hedrich R. R. Harkness W. H. Coon, M. D. Arthur Lederer, M. D.

Board of Advisory Editors
Dr. Peter H. Bryce, Ottawa, Canada. Dr. Livingston Farrand, Boulder, Col.
Dr. Charles V. Chapin, Providence, R. I. Prof. George C. Whipple, Cambridge, Mass.
Dr. William C. Woodward, Washington, D. C.

All expressions of opinions and all statements of supposed facts are published on the authority of the writer over whose signature they appear and are not to be regarded as expressing the views of the American Public Health Association, unless such statements or opinions have been adopted by vote of the Association

NOTICE TO SUBSCRIBERS

SUBSCRIPTION PRICE, $3.00 a year, in advance, to any point in the United States or its possessions. Foreign Countries, 50 cents extra for postage. Canada, 25 cents extra for postage. Single copies, 30 cents.
ADVERTISEMENTS accepted only from reliable firms. Fraudulent and misleading advertisements barred.
IN CHANGES OF ADDRESS both the old and new addresses must be given.
RENEWAL BILLS are sent one month in advance. Prompt attention to them prevents discontinuance from the mailing list. Magazines are not sent beyond the subscription period.
As the MAILING LIST for each month's issue closes on the first of that month, changes of address, renewals, subscriptions, etc., must reach us before that date to be effective with that issue.
COPYRIGHT, 1917, by Selskar M. Gunn.

It is with profound regret that we have to announce the death of Dr. Henry D. Holton, who died February 12, 1917. Dr. Charles A. Caverly, President of the Vermont State Board of Health, elsewhere in this issue has kindly furnished a short biographical sketch of Dr. Holton's life. The following tribute is written by Dr. Peter H. Bryce, a life-long friend of Doctor Holton.

In Memoriam.

Physician, sanitarian, philanthropist, legislator, patriot!! Of none who has passed from our Association could these several words, expressing that *integer vitae* which Horace used to express a full-rounded life, be more appropriately said than of Dr. Henry D. Holton, not alone of Brattleboro and Vermont, but of the United States and, indeed, of the whole American continent, for which he labored so earnestly and with such fruitful results. A son of New England and of its Puritan founders, Doctor Holton grew up amongst its mountains, which have echoed for three centuries to the voices not alone of liberty, but of all the loftiest ideals and purposes of life; and there from boyhood to a ripe old age he labored unceasingly to make this old world upon which he looked so calmly and kindly better for his having lived in it.

Primarily devoted to his native state, the claims of his country in its greatest national crisis developed in him, as in so many others, a wide perspective, which first found its fuller scope when as a physician he tended the returned soldiers,

who had fought for freedom and liberty. But fortunately for humanity, his active life was at the moment when modern science gave him the opportunity to play the splendid part not only of the accomplished physician, but also in that larger field of preventive medicine, which has accomplished so much for the public health of the world and not least of America. Doctor Holton's broad views of medicine not only led him to take an active part in the membership of many societies devoted to special phases of medical science, but also as early as 1873 led him to become a member of the American Public Health Association. Thereafter he urged the needs of State Medicine in Vermont many years before he saw his efforts rewarded in the establishment of the first State Board of Health.

His sense of public duty led him to take an active interest in public affairs, and first as a senator in 1884 and later as a member of the legislature, he not only seized the opportunity of learning legislative procedure, but also of obtaining that wide knowledge of public men, as well as the intimate acquaintance of such from all corners of his state, by means of which he was enabled to obtain public health legislation of a kind peculiarly suited to widely scattered settlements in a state with few urban centres. What he accomplished is common knowledge to the members of our Association; but the slow though sure steps taken, which led up not only to most complete executive supervision, but also to the evolution of one of the most active and efficient laboratories in any state, can only be known to one who has been fortunate enough to watch with friendly interest its development. Of the important part he played as member, treasurer, and later as president of the American Public Health Association, those who for years have been associated with him know best; and how during five years as Chairman of the Committee on JOURNAL, his enthusiasm, clear vision and generous financial assistance helped so powerfully to make the doubtful experiment of a monthly JOURNAL the success it is, can only be known to his colleagues in that work.

Of his personal qualities as a gentleman and friend the whole medical profession and many public men can amply testify; of the esteem in which he was held in his own community amongst whom he went out and in for half a century, the universal mourning of the fellow townsmen with whom he had so long held friendly counsel speaks eloquently. How he will long be missed by his intimate personal friends, those of us who were privileged to be amongst the number most acutely recognize; but we willingly though sorrowfully yield him to that final rest, which he has so well earned after his many labors are over.

THE NEW ORLEANS MEETING.

It has been decided that the New Orleans Annual Meeting of the American Pubiic Health Association will take place December 4–7, 1917. Members are requested to note these dates.

SCIENTIFIC MANAGEMENT AND ITS RELATION TO THE HEALTH OF THE WORKER.

RICHARD A. FEISS,
The Clothcraft Shops, Cleveland, Ohio.

Presented before the Section on Industrial Hygiene of the American Public Health Association, Cincinnati, Ohio, October 25, 1916.

SCIENTIFIC management, as the name suggests, applies the scientific method to all the activities of management. This means that the management assumes the responsibility for thorough investigation and procedure based on accurate knowledge. Not only are materials and equipment scientifically studied and methods for their use and up-keep established, but the human effort expended in their use must also be studied from the point of view of continuous up-keep. In fact, scientific management is the management of conservation. As such it must deal primarily with the conservation of human effort. This is true not only from the humanitarian point of view, but also from the economic. Taking the pure business aspect, there is nothing more profitable nor more essential.

2. In considering conservation of human effort the steadying of employment is of the greatest importance. The loss both to the management and to the worker through the constant change of personnel one finds in the ordinary industrial organization can hardly be conceived. It has often been estimated that the cost in dollars and cents of replacing an old employee by a new one amounts to anywhere from fifty to two hundred dollars. The loss to both the organization and the worker in effort, morale and efficiency, while less tangible, is far more important. A manufacturing concern in Detroit, employing fifteen hundred men, employed some thirteen thousand men, or over 800 per cent. of its total standing payroll from the spring of 1915 to the spring of 1916. A brass foundry in New England employing three thousand, employed during the first eight months eight thousand. The latter replacements would be at the rate of twelve thousand a year, or over 400 per cent. A large rubber concern in Ohio employing over ten thousand men and women is said to have a labor turnover of 150 per cent. At the Clothcraft Shops of The Joseph & Feiss Company an attempt has been made to approach this subject from the point of view of scientific management. The percentage of replacements during 1915 was 48 per cent., and for the first nine months of 1916 was no greater. This result comes from a realization of the importance of conservation of human effort, and of the fact that employment is not a mere matter of hiring and firing but, from the scientific viewpoint, is a matter of hiring and keeping.

3. For the purpose of scientific employment The Joseph & Feiss Company have established an Employment and Service Department. The

functions of this department are conducted from the point of view of keeping every position in the organization filled with fit men and women. The fitness of the worker involves primarily his health. It is apparent on the face of it that a worker under the handicap of even a minor ailment is going to suffer materially in his steadiness and efficiency. His health, therefore, must be conserved in the most scrupulous manner. For this purpose an adequate medical department is considered an essential part of the employment and service function. A medical examination is not only essential for the new employee but a periodical reëxamination and follow-up are also an integral part of the work. In this way alone can the results of the work upon the health of the worker be properly checked up and a course consistent with the best health of each individual worker be followed. Some of the details of this work and its effect have been touched upon elsewhere *

4. In connection with the health of the workers in industry, home conditions are of vital significance. No real educational or constructive work can be done without keeping this fact constantly in mind. The carrying of educational work into the home is of inestimable value. For a very capable description of this kind of work refer to an article entitled "The Relation of Home Conditions to Industrial Efficiency"† by Mary B. Gilson, Superintendent of the Service and Employment department of The Joseph & Feiss Company.

5. The poor health of a worker is commonly laid at the door of industry. Conditions contributing to the ill health of workers, however, are not inherent in industry, but are the result of unintelligent or unscientific management. While it is true that the conditions under which people work are responsible in some instances for ill health, a thorough investigation of the facts in each case would often disclose the ill health of the worker to be entirely due to personal habits or home conditions. It is common not only for the layman, but, also, for the physician to jump at conclusions in this matter. Physicians are often only too ready to lay the cause of an ailment to a man's work and to advise him, without any real investigation, to quit his job or not to work in a factory. It is very easy to make sweeping assertions as to factory work and to advise workers to leave their jobs on the slightest pretext of ill health, but professional men, above all, must realize not only the difference that exists between industries but also between various establishments in any one industry. The giving up of a job, even temporarily, is a matter of very great moment to the worker, and we question the right of any one assuming the responsibility of giving such advice without thorough investigation.

* "Personal Relationship as a Basis of Scientific Management." A paper read by R. A. Feiss before the Society to Promote the Science of Management, Philadelphia, Pa., Oct. 23, 1915.

†Appearing in *The Annals* of the American Academy of Political and Social Science, Philadelphia, May, 1916. Publication No. 1009.

6. By reason of the tremendous increase in the productivity of the worker which results under scientific management it has been accused of injuring the health of the worker. Scientific management not only recognizes the basic value of continuity of employment and longevity of the worker, but represents the only scientific attempt to increase production through the conservation of his health and effort. Although this may be contrary to popular conception, scientific management, nevertheless, obtains increased individual output, not by drive, but by the elimination of waste.

7. It is erroneous to assume that speed affects the health of the worker. Speed in itself is not injurious. Under scientific management it is the result of improving conditions of work which under ordinary management tend to contribute to his ill health. There are conditions under which operating at half the best possible speed is more fatiguing and more injurious to the worker's health than operating at the best possible speed under proper conditions. As a matter of fact when conditions have been properly standardized and operations are taught by an adequate system of instruction, motions become reflex. It is well known that reflex motion is not only essential to the best possible speed, but requires a minimum of physical and mental exertion. We call your attention in this connection to the statement of the eminent psychologist, William James:*

"Habit simplifies the movements required to achieve a given result, makes them more accurate and diminishes fatigue."

8. The enormous saving of time effected under scientific management not only results in increased achievement, but also makes it possible and profitable to bring about that generally desirable end,—the shortening of hours. Greater achievement makes possible the payment of the higher wages of scientific management and at the same time the shortening of hours without increasing the cost of production. Fatigue is not only minimized by the reduction of the hours of work, but also by the conservation of effort while at work. Scientific management directly concerns itself with the elimination of all factors of fatigue. To quote from a recent work on fatigue study:†

"Even where fatigue is not materially cut down during working hours, because measurement shows that the worker is not getting overfatigued, the general health is apt to improve because of greater regularity in habits of work, and because of better physical and mental habits, while doing the work. The path along this line is a continuous, never-ending, upward spiral. Fatigue is eliminated by establishing proper habits. Proper habits improve health. The improved health allows of more work with less fatigue, etc."

9. Under scientific management not only the physical condition of the worker in relation to his work, but also

*James, "Psychology," Vol. 1, p. 102.

†"Fatigue Study," by Frank S. and Lillian M. Gilbreth, p. 143. Sturgis & Walton Co., 1916.

the physical conditions under which he works are made subjects of scientific study. A study of proper ventilation, lighting and sanitation results in a direct effect upon the quality and quantity of his output. The management must not only assume the responsibility for standardizing and perfecting these physical surroundings, but all other conditions relating to the work before it can proceed with the standardization of the job itself with a view toward setting a fair task for the worker. Standardization of tools and equipment by means of time study and other research methods—of which the primary object is to eliminate unnecessary effort on the part of the worker—is an essential step in the increase of output. Materials also must be controlled by means of a proper routing system in order to insure an uninterrupted supply of work. By these means alone it is not uncommon under scientific management to effect an increase in output of 100 per cent. or more, while lessening rather than increasing the effort expended by the worker. Finally when time and motion study is applied to the job itself, the efforts of the worker are still further conserved by the elimination of wrong or unnecessary movements and by setting of a definite accomplishable task. No one realizes the amount of hopeless effort which is expended by the worker, nor the amount of time and output which is lost because of neglect of these important factors under irresponsible management.

10. Speaking of scientific management, Josephine Goldmark, in her exhaustive study on "Fatigue and Efficiency,"* says:

"The new organization of work has brought also a new emphasis upon the workers' physical surroundings. All those physical inconveniences which waste human strength and comfort and which are common rather than uncommon characteristics of our workshops,—such as bad air, bad light, overcrowding, dirt, and insanitary conditions,—are all marks of inefficiency in the management. They are intolerable to the system which is based essentially on the observation and study of cause and effect. Where the ordinary management sees in the crudest so-called 'welfare work' (better light, air, sanitation and comfort) merely concessions to the labor force, the engineer sees them as indispensable parts of the equipment. They are the mere commonplaces of efficiency, without which the accomplishment of predetermined tasks cannot be expected. . . .

"Scientific management obtains its marvelous results not only by teaching the worker the best possible way of accomplishing his task with the least time and effort, but also by removing all possible external obstacles. The management has, in advance, perfected his equipment and sees that it is always in perfect order and that the worker is regularly supplied with material in perfect order and condition. . . .

"One of the chief aims has been precisely to regulate the flow of work so that it shall be even and continuous. . . . Compared with such a régime, the crudity and chaos of ordinary sys-

*Pp. 201-202-203. Russell Sage Foundation.

tems stand out in glaring contrast. A revolution has been effected; a terrible waste has been checked, of that capital which alone is common and equal for all mortal beings: of time. . . . Hitherto hours, days and weeks of employment have been habitually lost to the workers through no fault of their own, but through the sheer incompetence of the management in performing its obligations and supplying materials and equipment fairly. No page in industry's history is more dreary and disheartening than the 'time lost' by competent and willing workers, waiting, unpaid, for employment which might be fairly regularized. Indeed, the daily delays and irregularities of work involve more than the direct loss of wage and earning capacity. They are more subtly interfused into the day's work; and the psychological gain which springs from the elimination of such daily annoyance and friction is undoubtedly an important factor in heightening working capacity under scientific management."

11. This brings out another important factor relating to the health of the worker. The psychological result which springs from the elimination of daily annoyance and friction is, as Miss Goldmark states, of vast importance in heightening working capacity; but is of even more significance in its effect upon the health of the worker. Scientific management replaces the old system of bosses with its petty annoyances and injustices by a system of functional foremen who are responsible for the development and training of the worker in all of his various functions. This functionalizing implies the assumption of direct responsibility by the management for all conditions and activities, including the important one of personal relationship. This, as Miss Goldmark has said, assures to the worker the "elimination of daily annoyance and friction" of paramount importance both to his good spirits and his good health. In the words of the late Frederick W. Taylor, "More than all . . . close intimate coöperation and constant personal contact . . . will tend to diminish friction and discontent."*

12. Mr. Gantt† not only shows by graphic charts how the capacity of the workers is definitely increased under scientific management, but also points out a marked improvement in right habits of work, self-respect and good health. Too much stress cannot be laid upon the connection between mental and physical well-being. For this reason, alone, scientific management can be credited with being one of the most important forces contributing to the health of the worker.

13. Every one who has visited a plant where scientific management has been practiced for any length of time is immediately struck by the apparent good spirits and good health of the workers. If the individual records of the workers at the Clothcraft Shops of The Joseph & Feiss Company were investigated, they would reveal not only consistent evidence of good health, but also in the majority of cases a

*"Principles of Scientific Management," p. 143. Harper Bros., New York.

†Gantt, H. L. "Work, Wages and Profits." Engineering Soc., 1911.

marked improvement. As evidence of the good effect of scientific management upon the health of the workers of this organization attention is called to the comparative stability of its working force as shown above. Although a large majority of the workers are women, over one-third have been in the continuous employ of this organization for a period of five years or more. During the year of 1915 with an average standing payroll of seven hundred sixty-two, the average daily absences for all causes amounted to less than seven and one-tenth persons, or about nine-tenths of one per cent.

14. Scientific management has as its object the maximum of prosperity for both management and worker. This object is attained not only by safeguarding, but also by directly contributing to the health of the worker.

◆

RED CROSS SEALS RAISED A MILLION.

Red Cross Christmas seals raised in the 1916 sale $1,000,000 for the tuberculosis campaign, according to the National Association for the Study and Prevention of Tuberculosis, which announced recently the results of the recent holiday campaign. All reports are not in, but carefully revised estimates of the few yet outstanding indicate that more than one hundred million seals were sold.

All the proceeds of the sale, amounting to a tax for health work of one cent on each person in the country except the insular possessions, are devoted to preventive tuberculosis work in the states and communities in which the seals are sold.

The National Association points with gratification to the fact that it realized its slogan "one seal for each inhabitant in the United States." Seals have been sold annually at the holiday season, beginning with 1908. They have been the means of raising a total of $4,206,051 for tuberculosis work. In addition to the thousands of tuberculosis beds which this sum has made possible, the seals have also aided in the establishment of hundreds of open-air schools, employment of thousands of tuberculosis visiting nurses, and have been an indirect cause of tremendous advances in the whole field of public health work.

Tuberculosis committees have been organized in practically every community of any size in the country. Every state in the union now has a state society engaged in state-wide anti-tuberculosis work. Hundreds of thousands of open windows, letting in unwonted quantities of fresh air to sleepers, may be traced directly to the public health educational effect of the Red Cross Christmas seals.

Last fall agents sold seals in every state and territory of the United States, except Guam, Tahiti and Samoa. Counting the school children, some 300,000 the total number of agents of the country approached 500,000. These included club women, school teachers, merchants, bankers, postmasters, and in fact, every kind of business man and woman.

The educational features of the seal campaign were developed in 1916 on a larger scale than ever before. School teachers received and read to their pupils one hundred and fifteen thousand story talks on tuberculosis. During Tuberculosis Week in December three hundred and fifty thousand pieces of educational literature, containing suggestions for sermons on tuberculosis and recommendations for medical examination of employees were distributed.

"Without the coöperation of the press of the country unstintedly given, as it always has been, these tremendous results from the Red Cross seal sale would have been impossible," said Dr. Charles J. Hatfield, Executive Secretary for the National Association, in making public the results of the sale. "Both directly and indirectly the newspapers of the country have, through the Red Cross Christmas seal sale, contributed to the alleviation of human suffering and to the total of human happiness, to a greater degree than any other single agency."

MODERN CHEMICAL INDUSTRIES AND PUBLIC HEALTH.

FRANCIS E. FRONCZAK, A. M., M. D., LL. B.,
Health Commissioner of Buffalo, N. Y.

Presented before the Section on Industrial Hygiene of the American Public Health Association, Cincinnati, Ohio, October 26, 1916.

THE scope of these remarks are, by obligation, limited to a consideration of the relationship of certain chemical industries to the health of workmen and the interests of the public health in general, and are based on the inspection of seventeen plants, the processes being electrical.

No reference can be made to the establishments themselves or their particular methods and procedures. Authority for an inspection was made solely to ascertain what conditions in connection with the various processes of the industry related to the public health.

About twenty five-years ago, electrical energy began to be generated in sufficient amount to warrant its use in the industries, and soon thereafter, means were perfected to modify its intensity and quantity—in other words, to control and perfect its adaptability and safety. Among the first industries to which this new force of energy was applied was the chemical, in the manufacture of well-known substances such as chlorine, caustic soda, bleaching powder, chromates of potash and soda, chlorates, and metallic elements like sodium and phosphorus, etc. These substances had all been produced previously, but it was sought through the means of the new agent to produce them on a much greater scale and likewise more cheaply.

The deleterious conditions accompanying production throughout the industry, are due to dust, noxious gases and highly heated compounds. To speak minutely of the undesirable conditions found would be impracticable without making reference to the processes involved themselves.

Dusts are consequent upon the grinding of mineral ores and various other mechanical processes, and the character of most of them is irritating, some in high degree, and a few are corrosive.

In establishments properly and sufficiently equipped to provide for their disposition, there would be little evidence of their presence or their consequences. This, however, is not the case in the industry in question, for within almost all classes of buildings where these processes are carried on (although there were exceptions) evidence of insufficient protective measures were found in the presence of dust upon the floors, ledges, upon the fittings of the factory and in quantity, and likewise permeating the air. In one plant, the equipment installed for the removal of dust was so small and imperfect that it was necessary to shut off one part of the outfit to secure a degree of efficiency in the other. Further evi-

dence of insufficient protective measures is found consequent upon their escape to the outer air, where the dust is wafted in clouds throughout the vicinity and deposited upon vegetation, buildings, fences and other structures coming within its action, with a resulting blighting and destructive effect.

Many gases of offensive and deleterious character and some possessing lethal qualities, are generated in quantities in almost all these chemical plants, and incident thereto, there is considerable leakage and permeation against the deleterious properties of which protective measures are not taken. On the contrary, they are purposely allowed to diffuse and escape to the outer air. As a matter of fact, buildings are purposely arranged so as to facilitate their escape in this manner, in order to bring about quick removal and dispersion, and in this manner, prevent or modify the consequences upon workmen. In one factory, an amount of actively poisonous gases arise without any sufficient device for protection, while in another, a very pungent gas escapes into the plant, one that is peculiarly irritating to the eyes and air passages, and all this without any attempt at control, although relief is said to be proposed.

In other of these industrials, noxious fumes like chlorine and dust like lime escape, sometimes in very small amounts, but under the various conditions of working and production, such as must naturally obtain in large industries of this character, the amount is generally large, contaminating the air of the neighborhood with the effect that what were once naturally attractive landscapes, are now converted into dusty, blasted, dreary wastes with a more or less smoky, gaseous, dusty atmosphere.

In some factories, certain mechanical processes are accompanied by a very high degree of noise, notwithstanding which, no protection whatever is made for protecting the ears of the workmen engaged in the work or of those in the immediate vicinity.

All these conditions are in consequence of the fact that the commercial end of production has minimized a proper consideration of the effect of deleterious substances escaping from the works, or the consequences of such escape have been entirely ignored and so much so has this been the case and so formidable have conditions become at times that the aid of the courts has had to be invoked to remedy the evil. In this connection, reference may be made to the fact that rapid advances, the development of new processes, the utilization of new methods, may have had their influence in deferring the adoption of protective measures.

No time need be taken in submitting evidence of the deleterious influences of these agencies upon the individual. In addition to experimental work and proof made in Europe, it is reasonable to assume that materials capable of exerting destructive action upon inanimate objects, are capable of exerting a likewise deleterious action upon individuals subject to their influence and such are the facts.

These dusts and gases exert their irritating influence upon the mucous membranes of the air passages and

vary in intensity and effect in accordance with the particular chemical character or property, and one, at least, is so formidable as to produce ulcerations wherever the parts exposed to its action present conditions permitting entrance to the tissues or an accumulation.

Neither need time be taken in submitting evidence of their destructive effect on their surroundings, nor of their influence upon those who are obliged to live in the section. Their diffusion is the course of complaint and legal action, not only by such residents, but even by neighboring industrials themselves, some of whom are likewise offenders and the remark that "the other fellow" is at fault is quite current.

In considering the relation of these industrial establishments to the preventive equipment and measures required by the state law, it is to be noted that the law requires certain protective procedures and methods to be followed, presumably efficient and ample. In practice, however, they are found to be incomplete or inadequate, partly through want of skill in application, partly through difficulty in meeting the indication and not infrequently in that the installation is perfunctory, that to some extent establishments only attempt to comply with the requirements of the law and fall far short of the mark. In other words, compliance is, as stated, perfunctory and not in the spirit of the law. It is but right to state here that in general the attitude towards employees is the conservation of their health in the interest of efficiency and that it is becoming more appreciated that the well-being of workmen means efficiency.

In relation to the influence of conditions upon those engaged in the various occupations, an attempt was made to get some statistics as to the amount of poisoning or sickness caused by the work. The difficulty is obvious and the replies were general and not specific; in illustration—a medical attendant on some of these industries reports in relation to exposure from benzol "that such exposure in small amounts appears to improve the nutrition of the men, as the great bulk of workers put on a great deal of flesh after being in the work a few months, that chronic poisoning is occasionally observed and denoted by blueness of the nails and mucous membrane and a slight shortness of breath, with a decrease in hæmoglobin, but that removal to other parts of the plant is followed by recovery in a few days or weeks and that no permanent ill effects are observed. Benzol stills operated in the open air do not seem to exercise a deleterious effect, either acute or chronic, but when within buildings with a limited circulation of air they do, so it is endeavored at all times to get plenty of fresh air administered by large fans or blowers. Acute benzol poisoning is like a liquor intoxication and a further stage lethal, and all workers are warned to seek the open air as soon as they begin to feel exhilarated and one man is never put to work alone. Death from benzol is apparently due to acute pulmonary œdema, as large amounts of brown frothy fluid

"are pumped from the lungs by the pulmotor."

"Chlorine fumes cause an intense bronchial irritation, with moist rales in the lungs; however, a few hours after quitting work, these disappear although an irritating cough is constant. In workmen exposed to chlorine gas, an increased tendency to pneumonia in extreme cold weather has been observed. Pulmonary phthsis is rare among these men. There are many workers here who have been in this line of work twenty-five years and their health compares favorably with workers in other lines."

All the factories visited claim their men are not injured by escaping products and point to the condition of some who have been with them for a long period of time.

The above are well-known generalities. However, in regard to the fact that some men are not injured or affected, it is to be noted that such is not evidence that all the men who have worked there have been free from the effects incident to the work, but only that the particular task of the long-time men or their possible idiosyncracy has kept them well. There may have been others who were seriously affected who have passed on to some other work somewhere else, where they can better stand the effects, but any record of them has not been kept or lost.

The prevention of damage from chemical work operated by electricity presents no problems which cannot be handled, and none that have not been satisfactorily solved abroad. It is only in this country where such industries have not been operated for so long a time, or where they are practically allowed to operate somewhat irrespective of consequences, that wholesale injury is present. In Great Britain and Continental Europe, there are stringent laws and constant efficient inspection to prevent outside injuries. This supervision and oversight began as long ago as 1863, and as indications arose, it was supplemented by further legislation in 1874 and 1881 and since that time. In relation to this supervision, the Encyclopedia Britannica, edition XI, volume 1, page 676, says: "There is hardly another example in the annals of legislative efforts equal to this, in respect to the real benefits incurred by it, both on the general public and on the manufacturers themselves."

This regulation of the chemical industry abroad comes under the direction of the Alkali Act and its inspectors are qualified men, having technical training and it operates under the provisions of the general government unaffiliated with local interests.

In relation to workmen in some establishments, applicants are subject to physical examination to determine their fitness for the work before employment.

All factories inspected were found provided with a proper first aid equipment which showed usage and some large establishments maintain a corps of physicians with one in constant attention.

In almost all places where workmen are subject to conditions indicating it, goggles for eye protection and helmets, some with oxygen supply, are worn.

In one establishment where, on account of its character, the condition of working men's teeth is important, a rigid system of dental examination and service is maintained. Every employee is obliged at an interval of three months, to be examined, and have necessary work attended to, all of which is during the time of and at the expense of the company. As a result of this protective measure, this concern claims to have absolutely eliminated the consequences incident to absorption of poisonous fumes through dental defects. Sanitary washing facilities are in evidence, and in many instances, shower baths were found installed. Metallic lockers are frequently provided though the ventilation of many locker apartments was often defective with the result that emanation from the clothing of hundreds and hundreds of workmen were in pronounced evidence.

In relation to the securing of proper conditions within the plant and the abatement of nuisance in the surroundings, there are, as stated, no problems that cannot be successfully handled.

It is indicated that where mechanical processes are carried on with incident production of dust, the apartment should be air tight, the machinery of special protective design and that an efficient exhaust system be operative to carry off the dust for proper disposition, that in apartments where leakage of gas permeates, provision for removal be made in accordance with recognized principles; that gases and fumes escaping from reduction processes, etc., be likewise disposed of.

As to the best methods of securing such equipment and their proper operation, it would appear that the experience in other countries is significant. As long as supervision is vested in local authority, conflicting interests have their influence; therefore, it is my opinion that industries of this character should be under the supervision and control of the national government, under a commission or otherwise, whereby there will be a standard of comprehensive requirements with systematic supervision and inspection by men technically qualified for the purpose.

MEDICAL CARE UNDER HEALTH INSURANCE.

How physicians, hospitals, and medical science will be brought more effectively to the service of the sick workers under universal health insurance is explained in a pamphlet just published on "Medical Organization Under Health Insurance" by Dr. Alexander Lambert, New York, Chairman of the Social Insurance Committee of the American Medical Association.

The full coöperation of physicians and public health officials, Dr. Lambert points out, is provided in the standard bill for health insurance prepared by the American Association for Labor Legislation and now before the legislatures of several states.

"In any large health insurance scheme," says Dr. Lambert, "a huge and intricate machinery is necessary and physicians are an essential part of this machinery. The service rendered by the medical profession must be on a business and not a charity basis. Sickness is an economic calamity for which the members of the community are responsible in varying degrees, and for which the whole community pays. The greatest economic asset that a workman possesses, is the health that enables him to go to work each day. If he loses that, he loses his power of earning his living."

The pamphlet covers thoroughly every aspect of the proposed system involving the medical provisions, with charts to illustrate the organization of medical care.

MUNITION-PLANT POISONS.

ARCHIE RICE,
International Steel and Ordnance Corporation, Parlin, N. J.

Presented before the Industrial Hygiene Section of the American Public Health Association, Cincinnati, Ohio, October 27, 1916.

THE European war has created unprecedented demands for the manufacture of several commodities that previously were little used.

Artillery, firing enormous quantities of explosive shells, requires that the bursting substance within the steel projectile shall be of such character that the tremendous concussion of the charge of powder in the cannon cannot make the departing shell explode.

None of the safety explosives thus used is really new. But their making and handling in Europe and the United States quickly developed into a huge war industry, employing, during a year's period, an aggregate, possibly, of one hundred thousand different individual men and women.

The possibility of the workmen becoming poisoned exists in the form of the fine dust and of the invisible vapor given off in the processes of manufacture and during the work of loading the projectiles with the bursting charge.

Either the dust or the vapor or both of them may be absorbed into the human system and get into the tissues through the pores of the skin, through the mucous membrane of the nostrils, of the mouth, and of the throat, and possibly through the lungs.

Russia, France, and the United States now use trinitrotoluol as a shell bursting charge. England uses trinitrotoluol and picric acid. Germany probably uses trinitrotoluol. And all of these countries use fulminate of mercury as the intensely powerful small agent to detonate the bursting charge itself when the shell strikes. A three-inch steel projectile approximately twelve inches long is made to burst into between one hundred and thirteen hundred ragged, flesh-tearing missiles.

Trinitrotoluol, picric acid, and fulminate of mercury are all nitro-substitution compounds.

These three and all other nitro compounds, except guncotton and nitrate of ammonia, are poisonous.

But after repeated absorption of small quantities of any of these poisons into his system the normal workman eventually becomes immune to that poison. For instance, a nitroglycerin worker daily absorbs a perceptible quantity of that oil into his body. He may bathe thoroughly in warm water, yet one, two, or three days later it may be possible to taste nitroglycerin on his skin.

All the nitro compounds have a faculty for accelerating the heart's action. Physicians frequently use nitroglycerin in small hyperdermic injections as a heart stimulant. Fulminate of mercury, a compound of nitric acid, alcohol, and mercury, is also a heart accelerator.

When professionally injected into the blood, these nitro compounds act directly on the heart, stimulating its beating. They also act on the heart when accidentally absorbed into the tissues of the body, but not so readily nor with the same power as when directly injected into the blood. Nature seems to combat the poison that enters through the skin and the mucous membrane. Efforts are made to get rid of it through the digestive tract and by the action of the liver.

Picric acid, which is a sort of chemical cousin to trinitrotoluol, is a nitrocarbolic acid. Because it acts more quickly it is more deadly than any of the other nitro compounds. This is because of the well-known characteristic of carbolic acid in its destruction of the mucous membranes of the mouth, throat, and stomach. And picric acid is more dangerous as an explosive, because it has the ability to change from a true acid to a metallic acid. For instance, if picric acid be allowed to fall on iron and remain there a few days it will be converted into picrates of iron, which is a very high explosive.

While more severe as a poison, picric acid is less dangerous to workmen because of its immediate disagreeable effects. It causes a puckeringly bitter taste in the mouth, a taste that persists for days. To avoid this bad taste workmen will keep their mouths shut and thus unconsciously protect themselves.

Trinitrotoluol is slower in being absorbed into the system, and it is slower in being thrown off by the action of the bowels and kidneys.

In its manufactured form trinitrotoluol is a fine yellow powdery substance somewhat like powdered mustard in appearance. In this condition it readily rises as factory dust.

Two methods are employed in loading it into high-explosive shells. By one process it is packed in dry. The more generally preferred practice is to melt it at ninety degrees Centigrade, converting it into a liquid that looks not unlike maple syrup, and then to pour it into the shell.

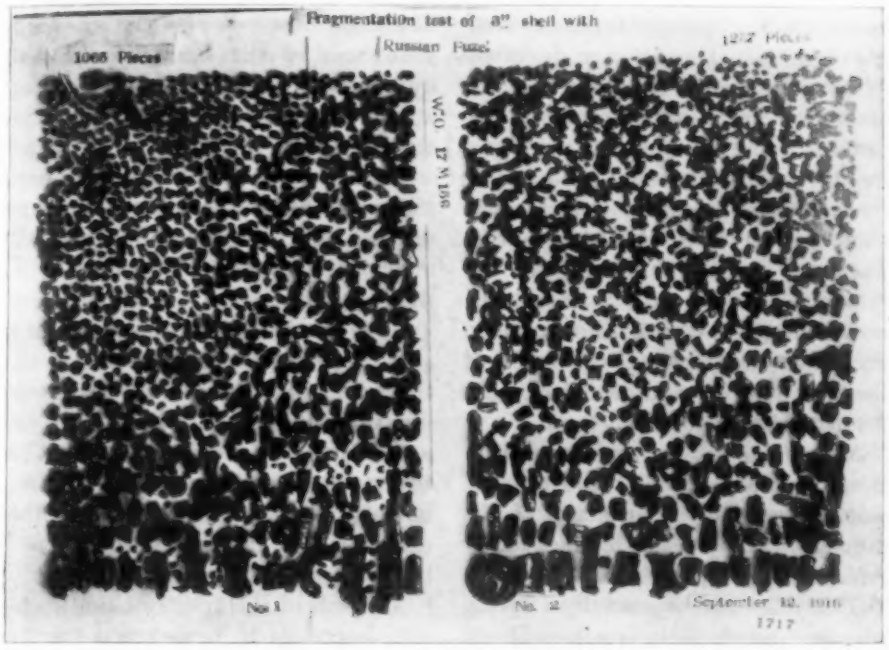
The dry method is all dust. The pouring process implies both dust and fume.

For eight months immediately preceding the 1916 convention of the American Public Health Association the writer of this paper has been a resident observer at a munition plant engaged in loading daily more than five thousand three-inch high-explosive projectiles with trinitrotoluol, using the pouring method.

During that period of eight months approximately five hundred different individual workmen came, by the nature of their employment, into regular manual and physical contact with both the dust and the fume of trinitrotoluol. Fifty of those workmen had to receive medical attention from a physician because of the effects of the trinitrotoluol upon them. Two of them died.

The experience of this one plant may be considered typical of what has probably happened in all the others, both in Europe and in the United States.

In the United States about three thousand men are regularly employed



The purpose of the safety explosive trinitrotoluol in a steel projectile is to burst the shell on contact half a mile to seven miles from the cannon, to rend into ragged fragments, any one of which will be more dangerous than a smooth rifle bullet. These fragments are showered in every direction, not a dozen but many hundreds of them. Trinitrotoluol at the moment of explosion emits a deadly gas if the place be underground and unventilated. The shells exploded in these two interesting examples were three inches in diameter, almost twelve inches long, and the steel alone weighed ten and a half pounds. The largest fragment is about twice as big as a door-knob, the smallest about the size of a rubber eraser end on a pencil.

in trinitrotoluol work in connection with munition contracts. But the newness of the industry and the popular fear of explosive factories as undesirable places of employment have tended to give the trinitrotoluol departments rather a transient class of labor such as is not generally trained or careful in hygienic habits. A large percentage of such men remain but a few weeks. So great is the tendency of this unsettled class to change that probably it is fair to assume that in a year's period as many as twenty thousand different men do some work in trinitrotoluol in the United States. Maybe twice that number of individuals are employed in trinitrotoluol work in Europe in a year.

The impermanence of the stay and of the residence of such workers has made it impossible to get a comprehensive record disassociated with effects produced by malaria, alcohol, and other agents.

One's first experience with imperceptible trinitrotoluol dust is a slight but distinctly noticeable bitter taste

in the mouth. Longer exposure than the first casual experience is often followed by severe headache. There may also come an intense quinine-like bitterness in the mouth, persisting for perhaps twenty-four hours and accompanied by some headache and nausea, with white frothy vomitus. These are usually the effects upon the occasional visitor, with a later tendency toward a degree of immunity. Such was the personal experience of the present writer and of several other men similarly exposed.

Among the regular workmen there is an obvious yellowing of the exposed skin, so generally that many of the munition-plant workers are facetiously referred to as "canaries."

This yellowness is generally a dyeing process, and similarly is noticeable on workmen's clothes, gray cloth especially turning a dirty, streaky yellow wherever touched with the fine dust and then subjected to a moist atmosphere. And this dye is permanent in cloth.

But in its serious forms upon the system, trinitrotoluol generally follows a regular course. At first it accelerates the heart action when some of it has penetrated the tissues and reached the blood. Next there is a clogging-up of the pores, accompanied by strenuous efforts of the tissues to absorb the poison and to get rid of it through the digestive tracts. Then comes, with the clogged pores and the accelerated heart action, an increase in blood pressure, often accompanied by an obvious purpling of the lips.

Nearly all the medical cases showed some increase in blood pressure. Many of them showed an increased yellowness of the skin accompanied by a heavily coated tongue, indicating a liver condition and not a mere skin stain.

Neither of the fatal cases was at any time, except just before death, more serious than the worst of the others, all of whom recovered with ordinary medical care and a desire to coöperate.

One of the worst cases, verging almost upon death, was of a frail, tubercular workman who obeyed medical instructions and was attentively nursed by his wife. He returned to the trinitrotoluol work and thereafter wore one of the respirators provided by the company but rarely desired or used by the workmen.

Most all of the trinitrotoluol workmen happened to be between twenty and thirty years of age. One of those who died was aged twenty, the other aged twenty-three.

Both died of symptoms independently diagnosed by separated attending physicians as yellow atrophy of the liver. This is a disease so rare that few veteran physicians have ever seen a case. Of the few hundred cases on record about two-thirds have been women victims, and of the women victims one-fourth to one-third evolved the disease during pregnancy. It has always resulted fatally. Its cause has heretofore been unknown, but has been attributed to some vague poison, perhaps produced in the human system under certain rare conditions, and confined to persons between the ages of twenty and thirty.

At death both these trinitrotoluol victims had turned a uniform greenish

yellow. All across their abdomens and chests were thickly distributed tiny pin-prick evidences of capillary hemorrhages just beneath the skin. The liver had, perceptibly to digital tapping, diminished in size. Unfortunately no autopsy was performed in either case.

The symptoms preceding these two fatalities were apparently in all respects identical with those of yellow atrophy of the liver. That rare disease has a course ranging within three weeks. First there is a period of general ill-feeling. Then come marked gastro-intestinal disturbances—griping pains across the abdomen—and the initial stages of jaundice. Next ensues a fever state. This is followed by delirium, with light-headedness and flighty utterances. That stage is followed by a state of coma lasting about twelve hours and ending in death.

A veteran authority on nitro explosives in the making has declared that while trinitrotoluol is poisonous it is deadly in its effects only when taken into a system using alcohol. If a workman will not drink alcoholic beverages, will bathe frequently, eat wholesome food, and take ordinary care of himself, there will be no serious results.

For the industry it is necessary that hoods and suction processes be maintained to draw off both dust and fume, that floors be kept clean, that there be abundant ventilation, that workmen be provided with overall suitings and protective gloves and with respirators, and that there be sanitary drinking fonts and hot and cold shower-baths convenient for the workmen. But, having provided such things, the company cannot compel the workmen to wash their hands before eating or to wear the respirators or to take the shower-baths. Nor can it exercise compulsion as to secret use of alcohol or neglectful personal habits such as make the human system less able to withstand any disease. But it can lay off for a day or so or shift to some other department men who begin to show signs of being affected by the poisonous dust.

At the plant to which particular notice has been given in this paper progressively improved safety methods were installed, and the condition of the working force steadily improved.

One man has worked continuously for eight months, daily handling trinitrotoluol barehanded and without wearing a respirator. And all the while this much-exposed workman has remained in robust health. But he takes good care of himself and does not drink.

One of the minor effects of contact with trinitrotoluol is a skin condition closely resembling that during an attack of poison ivy or of poison oak. The skin breaks out in blotches of tiny water blisters. Later it peels off in small flakes as after sunburn. For this condition of the skin magnesium carbonate in solution was applied with good results, generally effecting a cure in a few days.

All of this information would be of but transient interest if trinitrotoluol making and handling were probably to lapse after the war into a compara-

tively small industry. But it may grow in the United States to twice the magnitude of its war-time size.

Toluol is one of the numerous by-products of the refining of coal-tar. Wherever dyes are made in large quantities there toluol is also produced. And if dye-making attain large proportions in the United States and toluol become relatively cheap, then trinitrotoluol could be used to the extent of two hundred million pounds annually as a commercial explosive to be combined with nitroglycerin or with nitrate of potash. It could not be used alone in mine and tunnel work where ventilation is poor, as it emits at the moment of explosion a gas that would kill workmen in confined spaces. It has its value as a non-freezing dynamite and as a high explosive that is comparatively safe against shock and rough handling.

If it be extensively manufactured in the United States after the war, perhaps four thousand workmen would regularly be employed in the manufacture of trinitrotoluol.

The present trinitrotoluol industries in the United States are all in New Jersey, in adjacent eastern Pennsylvania and northern Delaware, in the northern part of Wisconsin, and in the central part of California.

SOCIAL INSURANCE AND NURSES.

The *American Journal of Nursing*, February, in commenting editorially on an article appearing in the current issue of that *Journal*, takes the following stand:

"If we understand Miss Russell's paper on Health Insurance, the point which we, as nurses, need to take under careful consideration in the passing of such laws in the various states is whether or not we, as members of a profession, wish to be beneficiaries under such laws; that is, whether such nurses as earn habitually less than $1,200 a year shall be included among the groups for which provision is to be made. Such legislation would seem to apply to the great body of private duty and public health nurses, to those holding subordinate positions in institutions, to young physicians, and to the majority of public school teachers, as well as to the industrial wage earners for whom it is primarily intended.

"We know of no group of people who are more entitled to such aid than nurses, for whether they are working in the proper spirit or not, their work is for the health of the community, and so far as we understand the intention of these laws, we believe that all public health workers whose salaries are inadequate should be beneficiaries. In the apportioning of the premiums to be paid, two-fifths by the employer, two-fifths by the employee, and one-fifth by the state, the difficulty of regulating the employer's fee, in the case of the private duty nurse, at once presents itself as a problem, but one which will have to be worked out. Similar problems have already been worked out in England in regard to both doctors and nurses but, we understand, not entirely to their satisfaction."

THE DANGERS CONNECTED WITH THE SPRAY METHOD OF FINISHING AND DECORATING.

DR. R. P. ALBAUGH,
Acting Director, Division of Industrial Hygiene, Ohio State Department of Health.

Presented before the Industrial Hygiene Section of the American Public Health Association, Cincinnati, Ohio, October 27, 1916.

THE spray method of applying varnishes, enamels, shellacs, lacquers, and practically every kind of finishing and decorating material brings with it the increased dangers of poisoning by the various hydro-carbons that are almost constantly used for quick drying and even spreading, as well as lead and other poisons used in the composition of the substances applied, unless unusual precautions are taken against the inhalation of these products by workers. The spray, or compressed air system, is gradually supplanting the old method of dipping and brushing, resulting in a better quality of work, greater speed and economy, a higher degree of efficiency, and, when properly equipped and operated, a greater degree of freedom from occupational poisoning should result. Unfortunately, during the period of development of the spray method, all effort was devoted toward perfecting the nebulizer in order to turn out a better finished product, while little or no effort was directed toward the removal of nebulous clouds of poisonous fumes and vapors which enveloped the person of the operator. As a result, we have seen a number of cases of poisoning by naphtha, lead, etc., in operators of these machines, and a number of others have been reported to us.

On September 13, 1915, our attention was called to the death of a youth the previous day, the cause of death being assigned as "Myocardial degeneration, probably caused by naphtha and turpentine poisoning." We called on the physician having charge of the case, who stated that the patient had first consulted him at his office six days previously. He gave his age as eighteen, single, American, and occupation as a sprayer in a filler and varnish room in a factory. He complained at that time of great weakness, periods of nausea, loss of appetite, tingling of extremities, constipation, and hemorrhagic spots over the body. He was very anemic and had lost about eighteen pounds in the past six months. The systolic blood-pressure was found to be 85, temperature 97.2 and pulse 69—weak and irregular.

On the second day thereafter the patient was compelled to take to his bed with the above symptoms exaggerated. The systolic blood-pressure was found to be only 75, the temperature below 94 (it could not be recorded accurately because the thermometer was graded down only to 94), pulse 90 and very weak and irregular. The urine was rather cloudy, specific gravity 1.022, acid in reaction, contained a trace of albumin, many hyalin

casts, a few finely granular casts, and a few cylindroids. Blood count: Erythrocytes, 3,500,000; leucocytes, 12,400; polymorphonuclears, 78.6 per cent.; small mononuclears, 16.4 per cent.; large mononuclears, 3 per cent.; and eosinophiles, 2 per cent. Spinal puncture revealed nothing. His condition grew steadily worse and on the fifth day he passed into a delirium and died the following day. An autopsy was refused.

On the occasion of one visit by the physician to the patient's home, he encountered three young men who came to visit the patient, and who were employed in the same department with him. They all described symptoms very similar to those of the patient, except in a milder form, and signified their intention of leaving the establishment.

As is customary in such instances, we called at the establishment where the patient had been employed and learned that for eight months he had been a sprayer in the varnish room. Each sprayer was covered by a large hood or cabinet of sufficient size to allow the presence of the article to be varnished and, indeed, the person of the operator, should he so choose. Each hood was equipped with an exhaust pipe with good exhaust. However, when the spray was directed against a flat surface, it would roll back and completely envelop the upper part of the operator's person, particularly if he were not careful of his position. It was observed that the workers paid little attention to being included in the escaping spray at frequent intervals, although such was not apparently necessary to perform the work. It was stated that a substance was used which contained naphtha and there was a very perceptible odor of "quick driers" present, suggestive of a turpentine and benzine combination. No respirators were worn nor were any adequate instructions given or enforced supervision concerning the exposure to the spray.

There are approximately 2,500 sprayers in use in Ohio and in only about 25 per cent. of them have the necessary precautions been taken to safeguard the health of the operators. The more common faults and imperfections which we have found are noted below:

1. Cabinet provided but exhaust absent or insufficient.
2. Good exhaust, but cabinet too shallow.
3. Good exhaust but poorly located in box.
4. Fan located too far from box.
5. Exhaust inlet too small.
6. Pipe occluded by accumulations of paint, varnish, etc.
7. Cabinet with flat back or top where exhaust inlet is located. It should be conical to provide uniform draft.
8. Tendency to apply spray at right angle to flat surface, causing it to roll back, enveloping operator.
9. Necessity, in spraying long objects, of getting out of range of the exhaust.
10. Inclination on part of workers to enter cabinet and sit on stand while spraying in order to rest after constant standing.

11. Ignorance of the presence of poison and dangerous character of the work.

12. Spraying promiscuously about the work room away from the exhaust box, as in "touching up" or trying the sprayer, etc.

13. Defective vision of operator.

14. Poor illumination of work space.

As the spray method of applying fillings, varnishes, colors and paints, dissolved in various hydrocarbons for quick drying and even spreading, is becoming very extensively used, especially in factory work, and as the fine nebular clouds produced give opportunity for unusual diffusion of the volatile substances present, nearly all of which are poisonous, employers should adopt unusual precautions against the inhalation of these products by workers. The installation of confining cabinets, exhaust pipes, etc., is not sufficient. The workers themselves must be strictly supervised in their work and their tendency to expose themselves to the spray. Undoubtedly many cases of increasing fatigue and exhaustion have developed among this class of workers, causing most of them to quit the employment. On the other hand, some who have remained have passed into the purpuric and later moribund condition here described, with fatal consequences.

◈

NOSTRUM ADVERTISING AND THE AGENCY LEVERAGE.

The ramifications of the fraudulent "patent medicine" business are many. The acceptance of advertising from such concerns by small country newspapers is not always an indication of a low ethical standard of advertising, at least not wholly so. One of the developments of modern business is the advertising agency, to which many concerns, instead of attempting to handle their own contracts, turn over their advertising business. These agencies place the advertisements in such publications as their special knowledge and judgment suggest will bring the best returns to their clients. Large agencies, having the power of dispensing advertising largess, naturally possess no little influence with publishers. Supposing, then, that the manager of a large agency is financially interested in a fraudulent "patent medicine" business whose advertising he handles—and there are some such cases. Suppose, further, that he submits an advertisement of the nostrum in which he is interested to a country newspaper publisher who tries to keep his advertising pages clean. If this country publisher rejects the "patent medicine" copy, he puts himself in the position of offending a man who has the power to send to him, or withhold from him, much reputable advertising business during the course of the year. As one of the big advertisers of the country has said: "Naturally publishers—particularly the little fellows—hesitate to offend a concern which sends them so much business even though they hate to accept this particular kind of advertising." When next you feel like "jumping on" the publisher of your local paper because of some particularly flagrant nostrum advertisement, find, out before you do so just how much economic pressure is being exerted, directly or indirectly to make him accept such advertising—*Journal of the American Medical Association*, February 3, 1917.

FACTS AND FALLACIES IN DISINFECTION.

HERBERT C. HAMILTON,
From the Research Laboratory of Parke Davis & Co.

Read before the Laboratory Section of the American Public Health Association Cincinnati, Ohio, Oct. 26, 1916.

ONE of the most important problems confronting the well informed health officer is that of cleaning up or preventing infection. Whatever measures he takes, these should be supplemented by an intelligent use of some chemical disinfectant. What shall he use? A new substance is proposed and gains a certain degree of popularity only to be relegated to a secondary place in favor of one still newer. One is likely to lose sight of the virtues of the older disinfectants in this maze of new products.

It is advisable to glance over the field occasionally to discover the advantages and disadvantages of these various substances; for while few are valueless only the best for the specific purpose is to be recommended.

A disinfectant is often overrated because in the hands of a careful user exceptionally good results were obtained. Some are discredited because of being used under improper or inappropriate conditions. Almost any substance may, under certain conditions, appear to be a disinfectant when in reality the conditions and not the substance were unfavorable to the development of the organisms.

If bacteria are transplanted from contact with a substance which reduced their vitality, to a culture medium slightly unfavorable for growth, an erroneous impression will often be obtained as to the germicidal value of the substance in question.

This actually occurred in testing a well known protein compound of silver which in a medium regularly adjusted by addition of hydrochloric acid to an acidity of 1.5, gave a phenol coefficient of 5 while in an unadjusted medium with acidity of 0.8 the coefficient fell to about .5 to 1. (See Protocol 1, Appendix.)

Another occasion for the discredit of a good disinfectant is the erroneous idea in the lay mind that a disinfectant is an insecticide. Formaldehyde fails as a fumigant for destroying insect life, a fact which may partly explain the appearance of adverse reports. (See Protocol 2, Appendix.)

The more probable reason, however, for the often expressed disparagement of formaldehyde is an improper use largely because of a misconception of its properties. Dry formaldehyde gas while exceedingly irritating to mucous membrane is almost innocuous to bacteria, the germicidal value being brought out only when in aqueous solution, or probably by the hydrate. It readily polymerizes, so that if slowly generated with insufficient moisture present, the active hydrate is not produced in a proportion to be efficient. (See Protocol 3, Appendix.)

Various improper methods have

been proposed and applied for generating the gas from its aqueous solution. Potassium permanganate or chromate by combining with a portion of the agent generates sufficient heat to volatilize the remainder with the necessary water, the amount destroyed not exceeding 20 to 30 per cent. of the original content, while the rapidity and completeness of evolution both of formaldehyde gas and water vapor more than offset the necessary loss.

When lime is used as the heating agent only the heat of combination with water can be permitted, since the lime-water slowly but almost completely destroys the aldehyde forming inert decomposition compounds. The same is true of caustic soda which is the reagent employed in one or more commercially exploited generators. It is also essentially true if calcium hypochlorite is so employed.

A prompt and more or less violent reaction occurs when a 40 per cent. aqueous solution of formaldehyde is mixed with any one of the above named reagents, but careful experiments failed to find effective quantities of formaldehyde among the evolved gases.

The method employed to determine the amount evolved was essentially that described by Frankforter (J. A. C. S., Vol. 28, 1906, p. 1234) the gases being absorbed by an excess of distilled water. By this method 30 per cent. of the theoretical quantity of gas was found to be liberated from a solution by means of potassium permanganate, while only 3 per cent. could be found when caustic soda was the reagent used. Lime is more efficient than caustic soda because a higher degree of heat is evolved in the reaction. Chlorinated lime under the same conditions appeared to evolve only chlorine compounds, no formaldehyde gas being detected in the aqueous solution collected.

Any rapid method by which the unchanged formaldehyde gas can be driven off from its aqueous solution is more or less satisfactory as a means of disinfecting a room by fumigation.

Formaldehyde gas, however, is so volatile that it must be almost immediately redissolved in water vapor or it will be dissipated before an effective strength is obtained. Therefore there are three highly essential factors in a successful fumigation with formaldehyde, namely, very rapid evolution of gas, a percentage of moisture in the air approaching saturation and absence of air currents. It follows that disinfection should not be attempted on a windy day, that the air must be rendered moist by sprinkling the floor with water about fifteen minutes before fumigation and if possible that a permanganate or chromate salt be used to develop the requisite heat.

Calcium hypochlorite or bleaching powder is one of the very few substances which spontaneously evolves an efficient disinfecting vapor.

The gas first released is chlorine which has a very caustic action on fabrics, colors and metals, and is therefore objectionable in most cases.

Hydrogen peroxide has had a varied reputation. Reputed very highly by some, it is considered worthless by

others. It all depends on the point of view and the way in which it is used.

With a phenol coefficient of .03 it is as strong as a 3 per cent. solution of phenol and therefore theoretically capable of destroying almost all infectious organisms. Practically, however, it is so rapidly destroyed in contact with organic matter that no great dependence can be placed on it as a disinfectant unless used repeatedly in considerable quantities. It has a value, however, all out of proportion to its germicidal action, in that as an active oxylizing reagent, the evolved gas acts as a cleansing agent, the foreign matter in wounds being extruded in a very efficient manner. It is therefore active in proportion to its hydrogen dioxide content but not primarily as to its phenol coefficient.

Much difference of opinion exists regarding the value of soap as a disinfectant. Tested against bacteria by any of the quasi-official methods a pure, neutral soap has little germicidal action in any practicable strength of solution. A 5 per cent. solution of most soaps is efficient in killing all non-spore-bearing bacteria in a few minutes but this is not a practicable solution to obtain except with soft soap.

Many soaps, however, are not neutral but decidedly alkaline and to this ingredient undoubtedly some of the relatively high values may be attributed. (See Protocol 4, Appendix.) A neutral soap or preferably one that is slightly alkaline is indirectly valuable because of its cleansing properties, particularly in its action to remove the protecting fatty film on the skin and allow penetration of an active agent. Theoretically a true disinfectant associated with soap is an ideal combination for cleansing and disinfecting the hands and the site of an operation. Practically, however, few of the disinfectants with which we are familiar can be advantageously used with soap either because of the physical properties of the resulting mixture or of chemical reactions impairing the quality of one or both of the two agents. Symes investigating this subject (Antiseptic and Disinfectant Properties of Soap, 1909) found that a 1 per cent. solution of soap—as strong as an average solution can be made—kills some bacteria in ten minutes, but most are not killed after hours of exposure, which is also true even of a 5 per cent. solution. He also found that no added disinfectant greatly enhanced the value of soap except biniodide of mercury which was very effective for disinfecting instruments and the field of an operation. Plain soap is germicidal toward some bacteria, notably B. *typhosus*. My own experiments (See Protocol 5, Appendix) have demonstrated that the different glycerides produce soaps which differ in their germicidal values, but that no soap can be considered an effective disinfectant unless associated with some other more active agent. The substitution of scrubbing with soap for fumigation in terminal disinfection is not a safe practice. The cleaning is to be commended but is not a substitute; it is only an aid to disinfection with a fumigant.

Ethyl alcohol is very largely used as a disinfectant for the site of an opera-

tion or injection, but by many it is regarded as of little value. It is generally considered that only the medium strengths of alcohol are active.

Experiments recently carried out verify the results obtained by Harrington and Walker (*Boston Medical and Surgical Journal*, Vol. 148, p. 548) (See Protocol 6, Appendix), who found that "unless the bacterial envelope contains a certain amount of moisture it is impervious to strong alcohol; but dried bacteria in contact with dilute alcohol containing from 30 to 60 per cent. of water will absorb the necessary amount of water therefrom very quickly, and then the alcohol itself can reach the cell protoplasm and destroy it."

It is evident, therefore, that sponging the site of an operation with alcohol after scrubbing with soap is a safe procedure; adding acetone to the alcohol is logical as a fat solvent and is quite commonly practiced. A further aid to disinfection is the addition of 1 to 2 per cent. of a high coefficient coal tar disinfectant to the acetone-alcohol mixture by which one can obtain a sterilizing solution equivalent to 40 per cent. phenol. (*Journal of Surgery, Gynecology and Obstetrics*, Vol. 21, p. 85.) Such a solution is neither poisonous nor irritating except when the hands are encased in rubber gloves after being treated with the mixture.

The high coefficient disinfectants of coal tar origin have several factors to contend with in finding a satisfactory position among the known germicidal agents. There is doubt as to the high values assigned to them on the basis of a laboratory test, especially since many coal tar products have been proved to be almost worthless. While it is true that no ideal method of standardization of disinfectants has been evolved many of the variable factors have been discovered and eliminated, so that there is reason to hope that germicidal agents may some day be as accurately graded as other chemical substances. The tests applied are relative, however, and there is little reason to suppose that a substance found by a careful laboratory test to be 2, 5, or 20 times as efficient as another similar substance would not be found in practice to have the same relative value when used under similar conditions. If the standard is of the same character and the conditions are the same the statement could not be questioned. Unfortunately the standard used for comparison is, although technically similar, actually decidedly different in many respects. Pure phenol has been chosen as the standard with which to measure the activity of all classes of disinfectants, and, while it belongs to the same series as the other phenols of coal tar, there are many conditions which change the resistance of the test organism toward everything but the standard. This is a generally recognized fact and is a serious defect.

On the other hand, the conditions imposed on the laboratory test are sufficiently severe as to eliminate most of these variants.

Another defect in the method of grading disinfectants by their phenol coefficients is the fact that different organisms have a ratio of resistance different from that of B. *typhosus*—the

standard test organism. With some organisms the values of disinfectants is higher and with others lower than their present rating. (See Protocol 7, Appendix.) Because of this and other factors involved, the Bureau of Animal Industry has felt compelled to reject all but pharmacopœial germicides for disinfecting premises possibly infected by hog cholera, foot and mouth, and other infectious diseases. This has made necessary the use of the relatively expensive cresylic acid, practically all of which is imported, while thousands of gallons of disinfectants from coal tar distillates of local production are barred from official use. This is a hardship because of the relatively high cost of the imported cresylic acid and is economically unwise because of its relatively low germicidal value. When properly carried out the germicidal test which establishes the phenol coefficient is of more value than a chemical test which compares phenol content only and takes no cognizance of the difference in character of the different classes of phenols. (See Protocol 8, Appendix.)

In connection with the policy of the Department of Agriculture in recommending disinfectants, a point is worthy of notice that lime is recommended to be mixed with the solution of phenol or of cresol compound in the proportion of not to exceed 1½ pounds to 1 gallon of solution. There is unfortunately no express instruction to use fresh water-slaked lime which would have a degree of germicidal value in itself. The lime compounds of phenol and cresol have about one half the germicidal values of the uncombined substances. While the lime mixed with cresol compound not only lowers the value of the cresylic acid, but is itself partly neutralized by the soap, forming a sticky inert lime soap. Such a practice, while intended for the good purpose of showing where the disinfectant has been applied, would appear to do more harm than good unless as noted above the lime used is fresh stone lime. In that case the freshly slaked lime would be of more value than the combined phenols. (Protocol 9 and 10, Appendix.)

Freshly prepared calcium hydroxide has a coefficient of approximately 20 based on the fresh lime used. (Protocol 11.) It is highly efficient theoretically, but as a practical disinfectant has only a limited application, because of its insolubility, instability and because of the residue wherever applied.

The effect of lime and magnesia as they often occur in the diluting water for coal tar disinfectants and dip is of considerable importance in that the emulsifying agent or solvent is in most cases soap. One part of lime combines with 12 parts of soap forming an insoluble grease no longer capable of emulsifying or dissolving a saponaceous disinfectant. Without this constituent the active agent is no longer in a finely divided state capable of acting uniformly but separates in a layer of oil which often causes considerable damage by reason of its corrosive character in this condition. Such a water should be corrected by the use of washing soda or caustic soda. When properly treated with one or both of these ingredients the water can

be safely used as a diluent for any of the coal tar dips or disinfectants.

The comparative values of an emulsifiable and a soluble disinfectant is a question that seems entirely profitless. It has nevertheless been claimed (Chick & Martin, *Journal of Hygiene*, 1908, Vol. 8, p. 654) that the former is the more efficient since the finely divided particles of the oil were observed to have a Brownian movement and, in effect, to bombard the bacteria.

Laboratory experiments fail to verify this hypothesis. These were carried out by using cresylic acid and soap, the ratio between the two being varied to obtain in the one case a complete solution, in the other with less soap a hazy emulsion. Careful tests of these two preparations failed to show any material difference. (See Protocol 12, Appendix.)

Another point in connection with coal tar disinfectants is the effect of exposure to light.

That this effect is to lower the efficiency is the statement made by Prof. Charles E. Higgins of Ottawa (personal communication) who found a marked decrease in germicidal activity in several samples so exposed for three weeks.

To verify this statement a sample was divided, one part remaining in an amber bottle, the other in a small clear glass bottle exposed to the light, partly direct sunlight.

After one month this was found to have lost about 8 per cent. of its activity as compared with the other part. This is not a negligible loss. It is one that should be guarded against by avoiding undue exposure of disinfectants, especially the sample for assay representing a bulk lot. It may well be that this is, in part, the explanation of disagreements in reports from different tests of the same preparation.

The actual loss, however, is insignificant and is offset by the fact that recommended dilutions are usually much lower than the efficiency of the preparation would permit. (See Protocol 13, Appendix.)

One occasionally wonders what combination of circumstances is responsible for the appearance and retention on the market of certain disinfectants for which high values are claimed and which uniformly fail to show these high values by any of the accepted tests. In the case of one product of this character it is claimed to be ten times as efficient as phenol while careful tests show a value only slightly in excess of that of phenol. The active constituent appears to be B-naphtol dissolved in glycerine. (See Protocol 14, Appendix.)

Another instance of a product less valuable in general than would be justified by the claims is one which has the recommendation of the hygienic laboratory. It is even called the Hygienic Laboratory Pine Oil Disinfectant. It is prepared from a specially distilled pine oil and the impression is given that any oil so prepared is equally valuable. It is described as if it were a new product, while as a matter of fact similar preparations have been on the market for years. Tests are shown (Public Health Report, October 8, 1915) on which a coefficient of 5 is claimed

and a dilution of 1 in 500 recommended for general use while this same dilution acting on a filtered suspension of B. *typhosus* failed to kill in 15 minutes' exposure. (See Protocol 15, Appendix.)

As an evidence of the possible harm done by such a publication a sample of disinfectant prepared in North Carolina from an oil supposed to be identical with the specifications had a coefficient of 0.5. (See Protocol 16, Appendix.) This producer was justified in expecting a coefficient ten times as high as his product actually possessed and on the basis of the statement below would be justified in marketing his product and quoting as follows:

(Public Health Reports, Oct. 8, 1915.)

"The new preparation is derived from pine oil, a by-product in the manufacture of turpentine. It is easily prepared by mixing certain portions of the oil with rosin and sodium hydroxide solution, the finished product being a reddish-brown liquid, rather thick and oily in appearance, but free from turbidity. With water it makes a perfectly white emulsion, much resembling milk. It has a pleasing odor, no objectionable taste, and attacks neither fabrics nor metals. It possesses over four times the disinfectant properties of carbolic acid and is altogether non-toxic, so that it may safely be used as a throat spray or mouth wash in solutions of the ordinary strength. The cost of the preparation is remarkably low, as it can be manufactured for less than fifty cents a gallon, solely from products which are produced in this country.

"It is believed that this new compound, which is to be known as "Hygienic Laboratory Pine-Oil Disinfectant," will become one of the most useful preparations of that character. Fortunately the high cost of the oil has prevented the flooding of the market with this low grade disinfectant."

A brighter picture is presented by Dakin who brought into use a valuable form of hypochlorite. While the solution Eusol and the powder Eupad suggested by him have no extraordinary values, the toluene derivative, Chloramine T, has properties which commend it to our attention. No extended examination has been made to determine its general applicability, but germicidal assays by the accepted methods show its value to be 50. (See Protocol 17, Appendix.) The presence of organic matter materially lowers this value, but when used as suggested by Dakin, it is probably a safe disinfectant.

On many occasions there is need for a preservative agent to prevent the bacterial decomposition of solutions of organic substances or drug and glandular extracts. While ethyl alcohol is more or less ideal for this purpose, in some cases it is not applicable either because of its action on an active ingredient or because of its effect on the patient.

Certain of the phenols derived from coal tar are made use of, especially in antitoxin. Where those commonly used are not applicable because of the irritation to tissues, other phenols from

high coefficient oil can be substituted to advantage. Their low toxicity, freedom from irritation and high antiseptic values all tending to make them very valuable. (Protocol 18.)

Another substance applicable for this purpose is Chloretone—trichlor-tertiary-butyl alcohol. A saturated solution—about 0.8 per cent.—kills B. *typhosus* after two minutes. It is less effective against spores and moulds but is almost universally applicable against bacterial decomposition. (Protocol 19.)

When the bacteriologists discovered that certain dyes have a specific staining action on bacteria it was the first step toward applying these dyes as germicidal or at least antiseptic agents. There seems to be no relation between color and germicidal activity but, regardless of color, the acid dyes appear to be inert and the basic, active.

No exhaustive experiments have been made to determine the value of these substances as disinfectants but experiments carried out by Churchman (*Journal Experimental Medicine*, Vol. 16, 1912, p. 221), Russell (Same Journal, Vol. 20, 1914, p. 545) Hill and Tabor (*Journal Infectious Diseases*, Vol. 15, 1914, p. 566) show a high degree of antiseptic value.

The low toxicity and freedom from irritation of some of the promising dye products lead to some experiments which showed that in vitro methyl violet has a phenol coefficient of 200 against Bact. *diphtheriæ*. Other dyes, gentian violet, malachite green, methylene blue, showed toward Bact. *diphtheria* and B. *typhosus* no remarkable value. (Protocol 20.) When the price of dyes resumes a reasonable level it seems very probable that some selected ones may be found well adapted to internal antisepsis and especially in attempting to control diphtheria and typhoid carriers.

In some cases it seems probable that, while certain of these dyes are strongly antiseptic in vitro, they are not exceptional germicides and, therefore, in the living animal are almost valueless. Unless the micro-organism is killed favorable conditions for growth are very soon resumed.

This is to a degree applicable to the chemical substance known as Chinosol which appears on the market also under the name Pix Cresol (*Journal American Medical Association*, 1911). While it actually has exceptionally high antiseptic value—many times more powerful than phenol—its germicidal value is almost negligible, and it finds little practical use.

To summarize the conclusions that may be drawn from the foregoing we find:

First, formaldehyde, when used under conditions in which the gas acts in an aqueous solution, is an efficient disinfectant, probably the only generally applicable fumigant.

Second, mercuric iodide combined with potassium iodide is an exceptionally valuable germicide for the skin and for disinfecting surgical instruments and vessels. Its germicidal value is 5,000 times as high as that of phenol.

Third, lime water freshly slaked from good stone lime has high germicidal value, but its objectionable features both in itself and in its action on

other disinfectants makes its use more or less detrimental.

Fourth, soap can be considered valuable only as an aid to disinfection or as a vehicle for an active agent. Most disinfectants with the exception of mercuric-potassium iodide add little to the efficiency of soap.

Fifth, alcohol as commonly used, *i.e.*, on the skin previously washed with soap and water is highly efficient, in percentages of 30 or over.

Sixth, a coal tar disinfectant carefully standardized by one of the accepted methods is valuable in proportion to its phenol coefficient and is less affected than some others by the factors which tend to inhibit the value of a germicide.

Seventh, pine oil disinfectants and other special products require as careful standardization as the coal tar disinfectants. For safe use the dilution should not exceed a number representing the result of the phenol coefficient, times the dilution of pure carbolic acid which would be used with confidence under similar conditions.

Eight, certain of the aniline dyes give promise of practical value in wounds and as internal antiseptics because of having a selective action toward certain microörganisms and because of their low toxicity.

The old dependable germicides, mercuric chloride, phenol, iodine, hydrogen peroxide, will never be displaced, but undoubtedly their field of usefulness will become more and more restricted. The trend of future research in the field of disinfection leads toward the development of specific germicidal agents.

Appendix.

Protocol 1. From original notes.

Silver compound Tested by Hygienic Laboratory Method.

	Medium Adjusted to 1.5 acidity.	
Dilutions.	*2½ min.*	*5 min.*
1–25	–	–
50	–	–
75	–	–
100	–	–
150	–	–
200	–	–
250	–	–
300	–	–
400	–	–
500	–	–
600	+	–

	Medium not adjusted—acidity 0.8.	
	2½ min.	*15 min.*
1–25	–	–
50	+	+
75	+	+
100	+	+
150	+	+
200	+	+
250	+	+
300	+	+
400	+	+
500	+	+

Protocol 2. From original notes.

Formaldehyde gas generated in a space of 800,000 cc. capacity.

54 cc. failed to kill bedbugs and roaches.

16 cc. failed to kill flies and moths.

These quantities exceed the amount necessary for efficient fumigation which is 13 cc. for this space. The experiments with bedbugs and roaches were continued with increasing amounts to determine if any quantity is toxic in vapor form.

The solution is said to be more or less toxic to flies when ingested, but is

by no means a specific poison when so used.

Protocol 3. From Bul. No. 27. Hygienic Laboratory.

Experiment 4.

Formalin used	600 cc.
Permanganate used	300 gm.
Capacity of room	2,000 cu. ft
Yield of formaldehyde	33%
Temperature	77°F.
Relative humidity	72%

Results	5	10	15	20	30	45	60
B. pyocyaneous	+	+	−	−	−	−	−
B. coli communis	+	−	−	−	−	−	−
B. dysenteriæ	+	+	−	−	−	−	−
B. subtilis	+	+	+	+	+	+	−

Experiment 6.

Formalin used	600 cc.
Permanganate used	300 gm.
Capacity of room	2,000 cu. ft
Yield of formaldehyde	37.7%
Temperature	71°F.
Relative humidity	45%

Results	5	10	20	45	60	90	120
B. pyocyaneous	+	+	+	+	−	−	−
B. coli communis	+	+	+	−	−	−	−
B. dysenteriæ	+	+	+	+	−	−	−
B. subtilis	+	+	+	+	+	+	+

Difference due to percentage of humidity.

Protocol 4. From original notes.

Germicidal tests of samples of Castile soap. Sample 1–6 inclusive were practically neutral. Sample No. 8 was distinctly more alkaline than No. 7 and both contained decidedly more alkali than the others.

Sample phenol.	*Coefficient.*
1	.05
2	less than .05
3	less than .05
4	.07
5	.05
6	.05
7	.18
8	.26

Adding 1 part KOH to 30 parts of No. 4, the resulting mixture had a coefficient of .3.

Protocol 5. From "Soaps from different glycerides," Hamilton. *J. Ind. & Eng. Chem.*, Aug. 1911.

Test organism—B. typhosus.

\+ indicates growth in subculture.
− indicates no growth in subculture.

Glyceride.	*Oil used.*	*Dilution.*	*Result in 5 min.*
Trilaurin	Cocoanut	1–40	−
		1–50	+
Tribrassin	Rape seed	1–20	+
Trivalerin	Whale	1–20	+
Trilinolein	Linseed	1–20	+
Triricinolein	Castor	1–20	−
		1–30	+
Tripalmitin	Palm	1–20	+
Triolein	Olive	1–20	−
		1–30	+
	Resin	1–20	+

Protocol 6. From "Germicidal Value of Ethyl Alcohol," Harrington & Walker, *Boston Medical and Surgical Journal*, Vol. 148, 1903, p. 548.

B. typhosus—Dried. Alcohol	5	10	15	30	45	60 min.
15%	+	+	+	+	+	+
20	+	+	+	+	+	+
25	+	−	−	−	−	−
30	−	−	−	−	−	−
80	−	−	−	−	−	−
85	+	+	+	−	−	−
90	+	+	+	+	+	+
B. typhosus—Moist.						
15	+	+	+	+	+	+
20	+	+	+	+	+	+
25	+	−	−	−	−	−
30	−	−	−	−	−	−
90	−	−	−	−	−	−
99	−	−	−	−	−	−

From original notes.

	1	2	3	4	5	min.
25	+	+	+	+	+	
30	+	+	+	+	+	
40	−	−	−	−	−	
85	−	−	−	−	−	
90	+	−	−	−	−	

Protocol 7. Phenol coefficients claimed for a commercial product.

Toward	B. pestis	40
	B. diphtheria	30
	B. entericus	20
	B. coli	17
	Cholera	42

From original notes.

Coefficients of two disinfectants based on two different organisms.

	B. typhosus.	*B. pyocyaneus.*
Disinfectant 1	4	2
" 2	16	4

Protocol 8. From original notes.

Phenols separated from coal tar oil and redistilled to further separate at each 10° C. or at such points as to obtain sufficient for germicidal test.

Emulsive disinfectants containing 78 per cent. of oil were made from each.

Boiling points.	*Coefficients.*
200°–210° C.	5.5
210°–220° C.	8.7
220°–230° C.	14.5
230°–240° C.	18.1
240°–280° C.	24.

The entire phenols made into a similar product had a coefficient of 17.

Ordinary cresylic acid with boiling points of 185°–205° has a coefficient of 4–5.

Protocol 9. From original notes.

Phenol in aqueous solution.

	2½ min.	*15 min.*
1– 90	−	−
1–100	+	−
1–110	+	−
1–120	+	+

Phenol molecularly combined with caustic soda.

1–20	−	−
1–40	−	−
50	+	−
60	+	+
80	+	+

Phenol molecularly combined with lime.

1–20	−	−
40	+	+
60	+	+
80	+	+

Protocol 10. From original notes.

Cresylic acid and soap.

[Cresol Compound U. S. P.] containing 50 per cent. cresols.

Dilutions.	*2½ min.*	*15 min.*
1–180	−	−
200	+	−
220	+	−
240	+	+

Cresylic acid combined molecularly with lime.

Dilutions based on cresol content.

1–175	−	−
200	−	−
250	+	−
300	+	+
350	+	+

Cresylic acid combined molecularly with caustic soda.

1–160	−	−
200	+	−
240	+	+
280	+	+

Coefficients based on the cresol content.

1st approximately	4
2nd "	2.4
3rd "	2

Protocol 11. From original notes.

Germicidal assay of freshly slaked lime.

Dilutions based on the lime (CaO) used.

Dilutions.	*15*	*30*	*45*	*60*	*min.*
1–1,000	−	−	−	−	
1,500	−	−	−	−	
2,000	−	−	−	−	
2,500	+	−	−	−	
3,000	+	+	+	+	
4,000	+	+	+	+	
Phenol dilutions.					
1–120	−	−	−	−	
140	+	−	−	−	
160	+	+	+	−	
180	+	+	+	+	

Coefficient about 20.

Protocol 12. From original notes.

Disinfectant No. A, about 80 per cent. Cresylic Acid, [Cresylic Acid 8 cc., Soft Soap 2 gm.]

Disinfectant No. B, about 50 per cent. Cresylic Acid, [Cresylic Acid 5 cc., Soft Soap. 5 gm.]

HYGIENIC LABORATORY METHOD.

Dilutions.	*Results.*			
No. 1 and No. 2.	2½ *min.*		15 *min.*	
	A	B	A	B
300	−	−		
400	−	+		
450	−	+		
500	−	+		
550	−			−
600	−			−
650	+		−	+
700	+		−	+
750			−	+
800			−	
850			+	

Phenol.		
90	−	
100	+	
110		−
120		+

Coefficient A 6.9.
B 4.6.

When calculated to the cresylic acid on the basis the amount contained in each

Coefficient A–8.6.
B–9.2.

Protocol 13. From original notes.

GERMICIDAL ASSAY—HYGIENIC LABORATORY METHOD.

Sample of disinfectant that has been exposed to the light August 28–September 19–28. (1) compared with the original sample (2).

	2½ 15 *min.*				2½ 15 *min.*	
1–1,200	−		1–1,200	−		
1,400	+		1,400	−		
(1) 1,600	+	−	(2) 1,600	−	−	
1,800	+	−	1,800	+	−	
2,000		−	2,000		−	
2,200		+	2,200		+	
1–1,200	−		1–1,200	−		
1,400	−		1,400	−		
1,600	+	−	1,600	−	−	
1,800	+	+	1,800	+	−	
2,000		+	2,000		+	
2,200		+	2,200		+	
1–1,400	−	−	1–1,400	−	−	
1,600	+	−	1,600	−	−	
1,800	+	+	1,800	+	−	
2,000	+	+	2,000	+	+	
2,200	+	+	2,200	+	+	

Phenol.		
1–100	−	−
110	+	−
120	+	−
130	+	+
140	+	+

Coefficient (1) 13.6.
" (2) 15.

Protocol 14. From label on package of disinfectant. "Leaves no odor. A powerful antiseptic and germicide of the Naphthalene series."

Inert Ingredients.
Water 23 per cent.
Glycerine 40 per cent.

"Seven times less poisonous and ten times more efficient than carbolic acid."

From results of assay

Dilutions.	2½	5 *min.*
1–100	–	–
175	+	–
200	+	–
250	+	+
300	+	+
400	+	+
600	+	+
800	+	+
1,000	+	+
Phenol.		
1–110	–	–
120	+	–

Coefficient 1.6.

Protocol 15. From Public Health Reports, Oct. 8, 1915, p. 3008.

B. typhosus, 20° C.

Phenol.	2½	15 *min.*
80	–	–
90	+	–
100	+	–
110	+	+
120	+	+
Pine Oil Disinfectant.		
375	–	–
400	–	–
450	+	–
500	+	+
550	+	+

Coefficient 4.75.

Note growth from 500 dilution in 15 min. subculture.

Protocol 16. From original notes. Pine Oil Disinfectant. From John A. MacKeathan, Fayetteville, N. C.

Hygienic Laboratory Method.

Dilutions.	2½	15 *min.*
1st test.		
1–150	+	–
200	+	–
300	+	+
400	+	+
500	+	+
600	+	+

2d test. *Dilutions.*	2½ *min.*	15 *min.*
1– 50	–	
75	+	
100	+	+
125	+	+
150	+	+
200	+	+
3d test.		
1– 30	–	
40	–	
50	–	–
75	+	–
100	+	+
125		+
Phenol.		
1–100	–	
110	+	–
120		–
130		+

Coefficient .55.

Protocol 17. From original notes.

Chloramine Assay—Hygienic Laboratory Method.

	2½ *min.*	15 *min.*
1,800	–	
2,000	–	
2,200	+	
2,400	+	–
2,600	+	–
5,000		–
6,000		–
8,000		–
10,000		–
12,000		+

Coefficient about 50. This test shows how important a factor time is in testing the value of Chloramine.

Protocol 18. From original notes.

Germicidal test of a mixture of water soluble phenols applicable where freedom from toxicity and irritation combined with high efficiency are essential factors.

Dilution.	*Time and Results.*	
	2½ min.	*15 min.*
1,800	−	
2,000	−	−
2,200	+	−
2,400	+	−
2,600	+	+
Phenol.		
90	−	
100	−	
110	+	−
120		−
130		+

Coefficient 20.

Protocol 19. From original notes.

Germicidal value of a saturated solution of Chloretone in distilled water (about 0.8 per cent.). The solution was inoculated with a culture of B. *typhosus* and sub-cultures taken at 1 minute intervals as follows:—

1	2	3	4	5	6	7	8	9	10
+	−	−	−	−	−	−	−	−	−

Protocol 20. From original notes.

Germicidal test of Methyl Violet against B. *diphtheria*. Sub-cultures made at 1 minute only.

Dilutions.	*1 min. Sub-cultures.*
1,000	−
2,000	−
5,000	−
10,000	−
15,000	−
17,000	−
18,000	+
20,000	+

Test of Gentian Violet under the same conditions.

Dilutions.	*1 min. Sub-cultures.*
1,000	+
5,000	+
10,000	+
20,000	+
50,000	+

Test of Malachite Green under same conditions.

Dilutions.	*1 min. Sub-cultures.*
500	−
1,000	−
1,200	−
1,400	+
1,600	+
2,000	+

INSTITUTIONAL SEWAGE PLANTS.

CHAS. F. MEBUS, C. E.,
Land Title Building, Philadelphia.

Read before the Public Health Administration and Sanitary Engineering Sections, American Public Health Association, Rochester, N. Y., September 7, 1915.

HOTELS, industrial establishments and institutions which house or employ a large number of people, use great quantities of water daily in toilet, bath, laundry and kitchen. This water, known as sewage, after having served its purposes, is charged with organic matter, grease, soap and other impurities, which will, when exposed to the air, putrefy and become a source of nuisance, unless provision is made for adequate treatment.

The population of hotels, institutions, etc., is concentrated on a few acres of ground so that the sewage must of necessity be discharged in comparatively large quantities at but few points, in contradistinction with the community or village which has its population distributed over hundreds of acres of ground and discharges small quantities of sewage daily at numerous points.

It is for this reason that the village with a population of several thousand may be able to get along without sewage treatment while the institution with the same population cannot.

Careful consideration as to location on ground available for sewage treatment purpose, is of first importance. Isolation from the institution, public highways, present and future residence sections, is highly desirable. The direction of the prevailing winds when the atmosphere is humid and hot also must not be lost sight of. By giving too great weight to element of low cost of construction and operation, one can easily be led into the selection of a site which may for sentimental reasons be unfortunate, from the fact that a sewage plant must not intrude itself too much upon those who occupy and manage an institution. The human mind appears to be averse to having its attention called too frequently to the fact that there is close by a plant where sewage is being treated. Sewage plants have been known to be charged with emitting bad odors, merely because the location brought the plant to the attention of those living near and suggested it as the cause, even though the source of the odor was something entirely different. In other words, the sentimental side of the matter is quite important, and cannot be overlooked in choosing a location. In fact, I am of the opinion that sentimental considerations often outweigh practical and economical ones in location.

Topographical conditions, the character of the soil, and accessibility, too, must be given proper weight, as it is only with these conditions favorable that initial low cost and economical operation are possible. Favorable topographical conditions are found where the surface of the ground is flat, near by a stream, and farther on steep enough to allow fitting into the natural conditions, the different units of the plant, so that the sewage may flow through it by gravity; and the topographical conditions are farther enhanced if they admit of the sewage being brought to the plant by gravity. On the score of economy and simplicity in operation, it is undesirable to lift or pump sewage, although it appears that breaking up of the solids, by centrifugal pumps, has its value, as sewage from institutions generally has but a short distance to travel and therefore arrives at the plant in practically its original state.

The character of the soil may be favorable or otherwise. If the soil is sandy and other conditions favorable, it is possible that a very simple broad irrigation plant may answer, otherwise more modern and expensive units will be necessary with a corresponding increase in initial cost.

Accessibility has value for the reason that, if a plant is too far out of the way, it may be more or less forgotten, become clogged, and work inefficiently.

Sewage treatment has been developed largely through experiments carried on by laboratories of educational institutions and experimental work carried on by national, state and municipal governments.

Institutional sewage is for all practical purposes of the same character as village sewage and, therefore, the type of treatment plant that will

give results for the town, may be successfully employed for the institution.

Much progress has been made in recent years in perfecting settling tanks that produce a thoroughly decomposed sludge, which gives off no offensive odors and is easily handled, so that the tanking or settling of raw sewage may be better and more easily accomplished than was formerly possible, and bad odors are less liable to arise.

Great advance, too, has been made in the filtration and aeration of settled sewage. The new practice is to spray the sewage effluent on coarse-grained filter intermittently rather than to apply it by the alternate draw and fill plan so extensively used some years ago. The method of applying the sewage to the filter under the spraying or percolating system is very much simpler than the draw and fill plan and therefore more dependable and positive in action which is a matter of great importance.

Simply settling sewage, with a subsequent treatment on a percolating filter, may be quite sufficient treatment, if the effluent from the coarse-grain filters can be discharged into a large stream or body of water, the oxygen in the water being well able, especially in a flowing stream, to oxidize the small organic content of the effluent. Such good fortune is, however, rarely met with and on the contrary the stream available may not only be small but also be used for drinking purposes, bathing, or flow through pasture land farther down stream. Such cases require a third treatment, either sand filtration or disinfection Should sand filtration be sufficient, several or a series of small simply constructed sand filters may be constructed and dosed intermittently from the percolating filter, the individual filters being dosed for a short period and then allowed to rest, while the other or the others of the series are being dosed in turn. Settled percolating filter effluent may be applied to such beds at comparatively high rates, about 600,000 gallons per acre, with satisfactory results, and with but little attention.

Where the final requirements are high, a chemical finishing process may be successfully employed at a low cost, but not without daily attention.

Liquid chlorine or chloride of lime dissolved in water will, when added to the sewage effluent of a percolating filter, produce a sterile effluent, provided that the proper proportions are used, and that the chloride solution is added uniformly and well mixed with the sewage effluent coming from the filter, five to ten pounds of chloride of lime added to 135,000 gallons of sewage effluent should give good results. Tests covering a period of six years at Danville State Hospital, and for shorter periods at Norristown and Warren Hospitals, show quite uniform results for all seasons of the year.

The sludge, or the settled out solids from the raw sewage as it flows through the settling tanks, must of course be removed at regular intervals and disposed of. This, on the institution farm, is usually an easy matter, as there is plenty of labor and ground available for its removal and disposition. Mention has already been made of the fact that the latest types of tanks produce a thoroughly decomposed and entirely inoffensive sludge, which is removed from the tank by merely opening a valve, and its water is drained off quickly by means of a small sand filter. The drying process takes but a few days, when the sludge can easily be handled.

Where natural conditions are favorable, that is where a sandy soil obtains which may be easily and effectively underdrained, the settled sewage may be applied intermittently to the soil, as a substitute for the smaller but more expensive percolating filter. In Pennsylvania, the soil is usually heavy and artificial filters are a necessity. Although expensive to construct, they have permanent value, require very little attention and take up but small space, for they may easily be dosed at rates varying from 1,200,000 to 2,000,000 gallons per day, depending, of course, on the effectiveness of the settling process and the nature of the finishing process required.

The matter of economical arrangement of units to take up but a minimum ground area, and yet provide for future enlargement, deserves more study than is usually given to the subject Compactness not only saves ground space and cost of construction, but it aids efficient operation as the entire plant is at all times before the eye of the attendant.

Sewage treatment, although basically the same for large or small works, differs, however, very materially in the conditions of supervision and maintenance. Large works require a complete organization for operation, which is usually directed by an expert. With the smaller

plants, the entire supervision, maintenance and operation may be and often is left in the hands of a man of most ordinary intelligence. It becomes, therefore, necessary in the design to adhere strictly to simplicity and positiveness of operation. All more or less complicated devices must be abandoned, the plant must be as nearly self-operating as possible, and further be "foolproof" against wrongful operation. For this reason, it is well to avoid rotating or fine screens, air lifts, complicated air-locking devices, and pumps.

Hospital sewage contains rags, smaller garments, sticks, pieces of soap, brushes, and an innumerable number of other things which insane patients manage to get into the sewers. This condition makes pumping, especially where the flow is small, not altogether satisfactory for the reason that much clogging of pumps results. Clogging may be avoided by fine screening, but this operation adds another difficulty, as screenings are difficult to dispose of, and the chances are good for screenings to be allowed to accumulate with more or less of a nuisance resulting.

The sewage treatment problem can be much simplified by intercepting at the source greases and soap in the solid, rags, and sticks, raw vegetables and fruits. Where the run of sewage is short and there is little screening and no breaking up of solids just mentioned by pumps, in warm weather, disagreeable sour odors may arise from the decomposition of undigested vegetables and fruits on top of settling tanks, as such matter is hard to get into the lower compartments of settling tanks.

As already noted, the sewage plant at an institution is likely to get into the hands of one who has but very ordinary intelligence and I know of one case where a mental defective has charge and another where a man past 70, inmate of a poor house, has charge. It is but just to add that in both cases the plants have excellent care, and the results of operation are quite satisfactory.

The reasons, I believe, are these: The operation is simple enough for them to fully comprehend; they are pleased by the fact that they are entrusted with an important branch of the institutional equipment; the results are always apparent, that is to say, chemical and bacteriological analyses are not necessary to show to the operator whether the results are good or otherwise.

The State Department of Health of Pennsylvania requires that samples of raw sewage and the effluents of the several units of the plant be taken weekly and sent to the department laboratories for bacteriological analysis. Although this method may not, in every instance, prove satisfactory, yet, on the whole, it appears to have the merit of interesting superintendents and operators and indirectly effects careful operation.

No one part of sewage treatment is more important than careful operation, which, among other things, requires that wiers be kept clean, that the rising sludge in air vents of Imhoff tanks be kept down, either by application of water daily, or by forcing it down with a rake; that floating matters in sedimentation compartments be kept scummed off; that nozzles of percolating filters be kept free from clogging; that the lines of pipes in the distributing system be frequently blown out; that the sludge in the settling tanks be withdrawn at regular intervals, and dried sludge promptly removed; that sand-beds be kept level and uniformly porous, to not admit of short circuits to form; that hypochlorite solutions be kept to required strength and applied uniformly and not spasmodically. For best results, records should be kept of daily flow, dates of sludge removal, results of analysis, and putrescibility. In fact, a sewage plant should be as carefully operated as an electric light or a refrigerating plant, or any other piece of machinery from which uniform standard results are required.

REFUSE DISPOSAL IN SMALL TOWNS.

GEORGE W. SIMONS, JR.,
Chief, Bureau of Engineering,
State Board of Health of Florida, Jacksonville

Read before the Public Health Administration and Sanitary Engineering Sections, American Public Health Association, Rochester, N. Y., September 7, 1915.

NOT long ago a middle western engineer made the following statement: "It is no uncommon thing to hear small town officials boast of a Great White Way lighting system and a casual observation, even at night, often discloses alleys reeking with garbage and refuse for the want of a regular collection system." This statement practically covers the ground but to make it more comprehensive I wish to include disposal systems as well as collection systems. If proper disposal methods are employed, collection systems are more than likely to be satisfactory.

In order to confine this paper to the present conditions as found in small towns, I shall take the liberty to discuss only towns under 8,000 inhabitants, assuming these as being typical of other small towns.

The information contained herein was acquired largely from a recent investigation conducted during the past year by Mr. Gladding and myself—also from personal trips taken and observations recently made.

The refuse problem in the average small town has received little or no attention up to the present time. In answer to numerous inquiries from towns throughout the country, it was astounding to note the laxity and carelessness shown this branch of sanitation. Not small towns alone are guilty of inactivity but it is regrettable to see many well-known large cities among the number. Methods of disposal in vogue are indeed primitive, but when one stops to consider and analyze the situation in the small town, conditions are not so alarming as at first it may seem. The methods of disposal employed are all that are demanded by the citizens and they seem perfectly satisfied in most instances. Owing to the small per capita quantities of refuse produced, the uncrowded living conditions, ample available dump grounds, lack of serious nuisances arising from refuse, all of which factors explain are reasons why the problem has not received more attention to date. The problem has not been brought forcibly to the attention of city officials as yet to any marked extent, but I am pleased to say that there is evident an awakening among many small town officials and in some cases actual signs of real live interest are being manifested. It was not uncommon in the investigation to have a city official express extreme regret at the condition his town exhibited. Lack of finances, lack of initiative coupled with lack of interest and coöperation is probably the real root of inactivity —considered in conjunction with the other above factors—in this line of sanitary municipal cleaning.

Commencing with the smallest unit and working to the largest we will note actual conditions as found today. In the towns, which by some present would be designated as villages—towns having populations not in excess of 1,500 people —we find no regular disposal system employed. In these places the houses are well distanced from each other, there is sufficient room and possibly each house or approximately every house keeps chickens, a dog, cats or even pigs. When the meals are finished the waste food matter is either cast out to the animals, or thrown into the slop pail to be dumped in some nearby low spot, and sometimes thrown onto the rear yard of the premises. The liquid waste is generally thrown onto the yard or into the alley, it being no uncommon sight to see streams of swill trickling down some alley. The ashes are thrown out each day on to a pile which accumulates throughout the winter and in spring is carted away to some low spot by the householder or a hired team. The rubbish, usually small in amounts, is either burned or thrown away with the ashes. Apparently no system is practiced, the disposal problem being of the least significance and when refuse does accumu-

late and become troublesome it is easily removed to some remote place.

Passing to larger towns—in range from 1,500 to 3,000, we still find no regular systematic disposal employed. These towns, as previous ones, are rural—many of the people keep chickens, pet animals and even pigs. What kitchen waste is not fed to the animals is thrown into the pail to be dumped as in the smaller towns. But in this instance the dumping ground is farther removed from the house and a teamster is paid by a number of people to cart the refuse to the dump ground. The ashes and rubbish, old cans, iron, etc., is removed once or twice a year as is seen fit by the householder. In many cases of towns within this limit, the town owns the dump ground which is located at the city limits or beyond. On the dump ground every waste product is placed and unless the dump is well attended and trimmed it is all but commendable. Even here the problem is not of much concern to the townsman, one or two men having carts with which they collect refuse from a few of their subscribers whenever time from other work allows. In some of these places farmers come to town and collect the organic waste each day from a few people, which they utilize for hog feed. Recently, in one of these small towns of 3,000 people, I spent considerable time studying the situation. Here the municipality maintained a dump yard at which, every day was kept a man whose duty it was to trim the dump, spread the material about, mix it, burn the loose paper and inflammable matter. As a result the dump looked very satisfactory, was neat and furnished a favorable means of disposal in this case. It was located a sufficient distance from the town so that odors were not perceptible at any time, as a matter of fact, odors were not noticeable 300 feet distant. This system of municipal dumps in small towns, if well attended, well trimmed, furnishes a favorable form of disposal, but one which is not to be encouraged or recommended.

In towns of this size and larger, 3,000, a junk dealer is located who picks up and buys scrap iron, metal, old rubbish, paper and rubber. This practice rids small towns of much bulky rubbish, at the same time brings considerable revenue to the inhabitants. Papers are sometimes baled and saved for the market—much of this work being done by charitable organizations.

In towns from 3,000 to 8,000, the problem begins to assume some of the serious complications met with in the larger cities. These places the dump is yet a favorite method. In one instance of a New England town of 8,000 a piggery is maintained at the poor farm, the garbage is collected three times weekly, sterilized before feeding and finally the pigs are sold while young at prices varying from $3.00 to $5.00 per hog.

In these places, many of which are growing rapidly, the available dump grounds are fast disappearing. The towns are spreading outside their former limits with the inevitable result—the former dump system is doomed. These places need an awakening. Incinerators or destructor furnaces which will burn everything, and give back power as a by-product should be installed. Rubbish burners, as at Dover, N. H., are being used in places where the garbage is retained for hog feed.

The disposal of manure is receiving more attention each season. In the smallest towns no precautionary measures are observed and the pile outside the barn is a familiar sight. But in the larger cities covered and screened pits are used and manure is hauled to nearby farms frequently. The people should be encouraged and taught to construct these tight pits, screened and covered because of the well-known fly-breeding propensities.

A troublesome form of waste in the small town coming to my attention this summer, which waste is more of a nuisance than all others, is that produced daily in the grocery and fruit stores. These establishments each day cast away the decayed and partially decayed vegetables and fruits. Only a few weeks ago I noted one and the same barrel filled with this class of refuse standing for two weeks without removal. It is a strong attraction for flies and rats and on warm days disseminates an unpleasant sour odor. The lack of a collection system was in this case, responsible for this condition of things—but the power of the health officer in such cases can be applied even in the absence of a collection system.

From this brief résumé it can be seen that the refuse disposal problem in the small towns has not advanced much from the primitive methods except in the cases of the towns which have

city tendencies. The dump is still the favorite method of disposal for all classes of refuse in the small town as long as land and places for dumping exists, and as long as no initiative is taken.

Most of the average towns have city ordinances on their books relative to the refuse matters, but that is as far as it goes. The question then arises—what will the city do, what kind of disposal can be employed most economically by the small town?

The dump, although not to be recommended or encouraged, is a necessary evil in the smallest towns. Lack of finances and a sufficiency of waste land will favor the dump yard. But if the dump is employed part of the health officer's business should be to see that it is properly attended and that the people using it exercise care in dumping. The material should be spread out to allow rapid drying and all inflammable material burned. Careless dumping of refuse around the yards, in the vicinity of houses, and the throwing of slops into the yards should be discouraged; where possible, proper drainage should be provided into sewers, or drains. The employment of closed cans at the house should be encouraged, also. Dumps will be used in most of the towns and when possible attendants should be furnished who are capable of caring for the yard.

The burial of refuse, garbage alone or garbage and ashes mixed, is found to be a satisfactory method of disposal providing the material is not buried too deep and in too large quantities, moreover the burial ground should consist of dry porous soil. Shallow trenches about one and one-half feet deep by seven feet in width are suitable and after filling should be covered with a loose covering of dirt—about five inches of dirt. From experiments carried on in Ohio it can be said that for a porous soil, about one and one-half acres are required to handle one ton-year of garbage and the same soil can be reused in two years. The burial method is better adapted to southern cities where it is warmer, but northern cities also employ it satisfactorily.

Incinerators, destructor furnaces and rubbish burners should be employed in the larger small towns—towns of 5,000 or over. These furnaces are generally made up in units of various tonnage capacity and furnish the only real sanitary, cleanly disposal of all organic, decomposing wastes. Incineration should be encouraged and given a boost wherever possible.

ACUPUNCTURE: THE BEST METHOD OF VACCINATION.

H. W. Hill, M. B., M. D., D. P. H.,
Director of Institute of Public Health, M. O. H. of London, Canada.

ACUPUNCTURE is the new method of vaccination which bids fair to do away with the old scarifying, scraping or scratching methods so familiar to our forefathers. These punctures are one one-thousandth of an inch deep and would not go through an ordinary visiting card. The extreme tip of an ordinary sewing needle, carefully sterilized, is used. Not a shred of the epidermis is removed. So slight is the pain that in several instances the operation was complete before the patients knew it had even begun.

If the vaccination does not take, nothing happens at all. If, however, the person has been successfully vaccinated before (or has had smallpox), the punctured surface will redden, swell slightly and become slightly itchy for a day or two immediately following puncture. This is the anaphylactic reaction. In those cases where the vaccination takes, the puncture spot will show nothing for four or five days, then redden, swell, and a single smooth pearly "button" arises about the size of a large green pea. In ten days or so this will shrink and become a dark dry "button" and in about ten days more, the "button" will gently separate leaving a small round scar. Ordinary areola develops and some tenderness of the axillary glands occurs.

Recently over sixty students of the Western University Medical Faculty were vaccinated

by this method.* No one who had been previously vaccinated or had had smallpox took at all; but all these showed the anaphylactic reaction described above. Everyone who had not been vaccinated before took. Three of these took in one spot each, one in two spots, and one in three. There was not a bad arm amongst them nor an hour of work lost or a lost meal. Amongst more than sixty students less than one small drop of blood all told was shed. This method therefore gave 100 per cent. of success in all the possible directions and not a failure of any description from any standpoint.

In two cases of students who showed the anaphylactic reaction although they had never been previously successfully vaccinated and had never had smallpox so far as they knew, careful investigation through their mothers of the alleged attack of chickenpox which both of them had had showed that in the one case it certainly was smallpox and in the other it very probably was. It is not uncommon for mild smallpox to be mistaken for chickenpox and some persons fail to take vaccination simply because they have had smallpox although they thought it was chickenpox.

Acupuncture vaccination is done as follows: The arm is washed with soap and water, then with alcohol, and finally with ether. A small drop of vaccine is deposited on the clean surface. The vaccinator's hand is closed upon the arm from behind so as to draw the skin tight in front, and the sewing-needle point, held slantingly nearly parallel with the arm, is pressed against the skin through the drop of vaccine. Then it is that one one-thousandth of an inch of the point snicks through the upper layer of the skin, carrying the vaccine with it. The needle is instantly withdrawn and another puncture exactly like the first is made close beside it, until a dozen punctures are made in the space of one-sixteenth of a square inch or less. The whole process of puncture takes perhaps fifteen seconds. At once with a bit of sterile gauze, the surface vaccine is removed, and the sleeve drawn down. Total time from rolling up the sleeve to rolling it down again, five minutes, most of which is occupied in washing the arm before making the punctures.

As a rule it is best to make three sets of punctures, one at each of the angles of an equilateral triangle having sides two inches long. Three scars are better than one and sometimes one set of punctures fails to take or even two; while out of three at least one "button" usually develops if the patient is susceptible to vaccine at all.

As in all vaccination by any method, neither the vaccinator or the vaccinatee should talk during the process lest the mouth spray should be carried in with the vaccine. In the puncture method the danger of infection from this source is, as from every other source, infinitesimal, for two reasons, first because there is no blood drawn and blood in a vaccination wound is the great inviter of infection. Second, because no epidermis is removed as in the old method, and the epidermis is the natural protection of the body against infection. At the same time, there is no danger of tetanus because the puncture is less than one one-thousandth of an inch deep.

A strip of sterile gauze may be pinned or sewed to the inside of the undershirt so that it lies just over the punctures. No other dressing should be used under any circumstances whatever; no shield, no absorbent cotton, no bandage, no adhesive plaster. "*Leave it alone!*" Don't wash it, don't scratch it, don't do anything to it. After the vaccinator has made the punctures nature will do all the rest that is required.

Vaccination by the puncture method is perfectly harmless. If the patient is already protected, he will not take: if he is not protected then the only thing is to become protected. The arm is punctured; if protection is needed, protection will develop; if it is not needed, nothing happens, except the anaphylactic reaction which is the proof that protection is not needed.

This method was first suggested to the writer by Dr. J. H. Kinyoun of Washington, D. C., a number of years ago. It has been used with great success in Minnesota and in London, Canada.

* Since writing this article the acupuncture method has become the official method in Military District No. 1, and many hundreds of soldiers have been vaccinated by this method with peculiarly gratifying results.

By organizing the vaccination and having about eight orderlies to do the various stages of washing, placing the vaccine in position, etc., the Medical Officer can perform about three acupuncture vaccinations per minute, which means that six hours will suffice for the vaccination of the battalion.

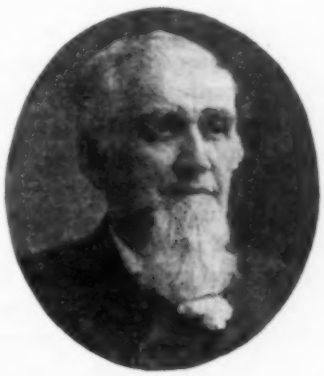
It has been found that no dressing whatever, not even the small piece of cloth mentioned in the text is necessary. In fact, the men do better without any dressing at all.

Henry Dwight Holton, A. M., M. D.

An Appreciation and Biographical Sketch.

Henry Dwight Holton, A. M., M. D., President of the American Public Health Association in 1901 and 1902, died at his home in Brattleboro, Vermont, February 12, 1917, of malignant disease of the pancreas.

Dr. Holton was born at Saxtons River, Vermont, July 24, 1838. His preliminary education was obtained at Saxtons River Academy. He studied medicine with Doctors J. H. Warren of Boston and Valentine Mott of New York, graduating at the University of New York in 1860.



After six months of dispensary work in Brooklyn, he settled in practice in Putney, Vermont. His practice there was that of a general practitioner, and was extensive. In 1867 he removed to Brattleboro, where he spent the rest of his life. He early took a leading place in the profession of the Connecticut Valley. His practice reached into Massachusetts and New Hampshire. He was long the best known surgeon of these parts and enjoyed the confidence of the profession over a wide range and to an unusual degree. Doctor Holton's professional activities continued until his election as Secretary of the Vermont State Board of Health in 1900. He gradually relinquished his practice thereafter and devoted himself to his official work and the many business and scientific organizations with which he was connected.

During his active professional life he was a member of the Connecticut River Medical Society and the Vermont State Society and served each as president. In 1873, he was called to the chair of Materia Medica in the Medical Department of the University of Vermont and filled this lectureship thirteen years. He was also a trustee of the University and State Agricultural College for eighteen years from 1873. At the same time he was medical examiner of the Vermont Asylum for the Insane at Brattleboro.

He joined the American Medical Association in 1864, was a vice-president in 1880, and delivered the oration in State Medicine at the Baltimore meeting in 1895. He was active in the organization of the Pan-American Medical Congress and in the National Society for the Study and Prevention of Tuberculosis, and was a member of numerous other scientific organizations in this country and abroad.

Of all his scientific society memberships, Doctor Holton always prized highest that in the American Public Health Association. Its members, especially those oldest in its counsels, were among his warmest personal

friends. His membership dated from 1875. In 1892, at the first meeting in Mexico City, he was elected treasurer, a position he filled until his election to the presidency in 1901.

Doctor Holton's name in his native state will always be associated with the State Board of Health and its activities.

He was one of a committee of three of the State Medical Society which in 1873 urged the General Assembly to establish such a Board. The report of this committee asked for "favorable consideration for this measure, assured that in no better or more speedily remunerative way can the state appropriate a portion of the people's money or more certainly fulfill its high mission, than in protecting its communities, old and young, from the approach or prevalence of contagious and infectious disease."

Later, as member of the House and of the Senate, he interested himself in the establishment and strengthening of the Board. The Board was finally established in 1886. Dr. Holton was appointed to it in 1896, and was its secretary from 1900 to 1912. In the latter year he insisted on retiring from the secretaryship, though he retained his membership to the end.

A man of untiring energy, in everything he undertook, he devoted himself most unselfishly to the work of the State Health Board. He loved the work and believed in it. He had seen, in his early country practice, the ravages of typhoid, scarlet fever, diphtheria and tuberculosis. He early recognized the possibilities of preventive medicine as regards these infections. He familiarized himself with every community in the state, and learned the individual needs of each. Schoolhouses, water supplies, sewage disposal, disease outbreaks, no detail of local sanitation escaped him. His services were constructive and fearless. He inspired health officers with some of his own energy and optimism, for he was always an optimist. He could criticize a local health officer or prosecute a delinquent man or community and still retain their self-respect. His high notions of official duty were strongly tinctured with good common sense and the milk of human kindness. No finer or juster tribute has been brought forth by his death, than an editorial in a paper, published in one of the five towns, in which it became Doctor Holton's duty, acting for the Board a few years ago, to condemn the public water supply and order a change. Among other things the Enosburg Standard says:

"In the death of Dr. Henry D. Holton, which occurred Monday, at the advanced age of seventy-eight years, Brattleboro and the state of Vermont have lost a man whose long and unselfish service of a public character has been of inestimable value to both.

"Such public service as that rendered by Doctor Holton can not be measured by dollars and cents and was never so measured by him. He gave, without thought of compensation, of his talent and energy, the memory of which and of the many beneficent results of his activities will live after him."

It was fitting that the state legisla-

ture, in session at the time of his death, should promptly adopt resolutions of regret and appreciation.

The village of Brattleboro mourns a loyal and public spirited citizen. He was the progressive physician, the intelligent public servant, the astute business man, the kind neighbor.

During twenty-five years' service, as member of the School Board (fifteen years as its chairman) he was largely instrumental in building two of Brattleboro's largest school buildings. The Brattleboro Home for the Aged and Disabled, and the Austine Institution for the education of the deaf and blind, both of which owe their existence chiefly to his industry and broad humanitarianism, were objects of his special care during his last years.

He was trustee from the first of the Brattleboro Free Library, and moderator for twelve years of the town meetings. These are some of the evidences of the confidence of his neighbors of half a century.

The *Vermont Phoenix* speaks of him as a rare combination of skilled medical practitioner and keen business man.

He was for sixteen years president of the Brattleboro Gas Light Company; director for many years, and latterly president, of the Vermont National Bank; and director and vice-president in the Fort Dummer Mills.

He gave generously and unostentatiously. A year's subscription, to each of the 247 local health officers, to the AMERICAN JOURNAL OF PUBLIC HEALTH, and the endowment of a lectureship on Preventive Medicine in the State Medical Society are instances of his benefactions, for a long time anonymous.

His was a life of action. He was of a truth happiest when busiest. When personal bereavement came to him, his consolation apparently was in work. Age did not dull his interest in life's activities, and only of late had disease lessened his vigor. Thirteen days before his death, the State Board of Health held a meeting in his sick-room. In spite of physical weakness, his interest in the activities of the Board was unabated. All present believed he recognized that it was his last meeting with them, yet he took the same sane, practical, view of the subjects discussed as always characterized his counsels.

Doctor Holton married Miss Ellen Hoit, November 19, 1862. Mrs. Holton, for many years in infirm health, died in 1909.

CHARLES S. CAVERLY, M. D.

February, 1917.

FIFTH REPORT OF THE COMMITTEE ON COLD STORAGE.

Presented before the American Public Health Association, Cincinnati, Ohio, October 25, 1916.

To the Members of the American Public Health Association:

YOUR committee in reporting progress wishes to emphasize at the outset its conviction that cold storage of perishable foods is one of the most important factors, if not the most important, in the conservation of such products. As such it has a very direct bearing on the question of public health as well as playing a most important part in the economic aspects of the public life. No one who reads carefully the few facts that we here present can fail to be convinced of both these statements. Nor can it be longer doubted that cold storage, conducted under the optimum conditions which modern science and practice have prescribed, is one of the greatest of blessings to mankind and should be encouraged. We need greater and more widely distributed facilities for the cold storing of perishables to cut down the enormous annual loss from spoilage and thus make available a larger amount of good food at lower costs.

Your committee has noted during the past year a more kindly feeling toward cold stored foods on the part of the consuming public. The prejudice which naturally sprang up when this new method of conserving foods was introduced is slowly breaking down. We believe the time is at hand when the consumer will realize that a cold storage warehouse is only a big refrigerator, such as each householder has on his home premises, excepting that the warehouse is much more perfectly adapted to the purpose of preserving perishable foods, having compartments where varied articles may be kept at temperatures and under conditions best suited to each and not everything in one compartment where the conditions must of necessity be the same for all foodstuffs.

We have also noted a tendency to saner legislation on the part of our law makers although there is still a feeling in many places that cold storage is simply a scheme for cornering a food supply and raising prices. Food officials generally are recognizing the great value of cold storage and are giving encouragement to it under wise regulation. And in general there is cause to feel that distinct progress has been made the past year in promoting the cause of better and more widespread conservation of perishable foods.

FACILITIES.

Ice and Refrigeration, a journal devoted to the interests of those engaged in the ice and refrigeration business, in its issue for October, 1915, summarizes the facilities for the cold storing of perishable foods. It states;

"There are now approximately 1,000 general cold storage warehouses in the United States having cold storage space of about 250,000,000 cubic feet. If to this be added the cold storage rooms

in packing houses and breweries, the figures will become, with 650 packing houses and 1,200 breweries, approximately 3,000 cold stores and artificially cooled space of at least 400,000,000 cubic feet. Then, if to this be added the cold storage rooms of creameries, produce merchants and apple storers, at least 2,000 more must be added, and the number of cold stores will reach at least 5,000 and the cooled space approximately 500,000,000 cubic feet, and that still would not include the cold storage refrigerators in some 3,000 meat markets, 600 or 700 ice cream factories, 1,000 hotels, 400 restaurants, 200 club houses, 400 hospitals, 500 confectioners and bakers, 300 department and general stores, 300 grocers, 300 public buildings, asylums, prisons, etc., 200 fish handling plants, not to mention artificially cooled departments in chemical laboratories, powder factories, government posts, etc. The value of the products kept from spoiling by refrigeration in these more than 12,000 refrigerated places has never been estimated, but it must be enormous."

During the year that has elapsed since this statement was written there have been constructed, or there are now under construction, between 40 and 50 new cold storage houses with an aggregate cold storage capacity of from 20,000,000 to 25,000,000 cubic feet. A considerable number of apple storage houses have also been built in the apple growing sections of West Virginia, Arkansas, Missouri, Texas, and New York. A very large part of this new space is located in cities where already large facilities existed. Very slowly, indeed, do warehouses make their appearance in the centers where perishable foods are grown. This committee has more than once pointed out the importance of having local cold storage warehouses thickly scattered in the producing sections. This is most desirable not only from the standpoint of conservation, but from an economic one as well. As we pointed out last year and in another part of this report, the very large drain on our resources due to the European conflict makes it most essential that everything possible be done to stop unnecessary wastage. That these local warehouses are very much needed and that they may be successful when erected and operated is nicely illustrated by a short article which has just been printed in the JOURNAL, entitled "Cold," in the October, 1916, number. A few of these are being built each year, but as yet the number is so small as to be almost negligible. The United States Department of Agriculture has been lending much aid and encouragement to the development of cold storage facilities. During the past year in conjunction with some of the state authorities it has been making an effort to have meat cooling plants established in the South.

TRANSPORTATION.

The use of refrigerator cars in the transportation of perishables is almost as important a part in the conservation of foods as the storage of the same for longer or shorter periods in cold storage warehouses. This branch of the cold storage business has developed very rapidly. An authority on this subject

has recently stated that there are now over 100,000 refrigerator cars in the United States and another authority states that at the time of writing (May, 1916) there were between 3,000 and 4,000 cars under construction. These cars are so satisfactory and so well operated that the whole aspect of the trade in perishables has been greatly changed. Those on the Atlantic seaboard may now enjoy the fruits of California and the extreme West. Mr. E. D. Clark, of the Bureau of Chemistry, United States Department of Agriculture, writes that the Pacific now furnishes the bulk of the fresh salmon for the eastern market. Fast express trains made up of refrigerator cars carry the fresh fish from the Pacific to the Atlantic in from five to seven days. The blessing that such a service is to us of the United States is immeasurable.

In Kansas there is a movement under way to require the railroads to place refrigerator cars at egg producing centers to receive eggs as brought by the farmers and thus act as temporary local cold storage warehouses.

Foods Stored.

From the most reliable information available to your committee it would appear that the amount of foodstuffs cold stored in 1916 is somewhat less than that in 1915. The latter year was an exceptional year, every available house having been filled to overflowing. The amount, however, will probably be greater than 1914 and will represent a normal increase.

Each succeeding year sees some new use made of cold storage. Some food heretofore not kept in cold warehouses has been tried and found to keep satisfactorily under such conditions. During the past year California reports successful experiments in the keeping of tuna fish and ripe black figs. The fish, it is claimed, are improved by the cold storage treatment. From St. Paul comes word that it has been found practical to freeze sweet corn on the cob to be served during the winter. The experiment was first tried by Dr. Pennington of the Federal Food Research Laboratory several years ago but has only during the past year been tried on a commercial scale. From St. Paul also comes news of an experiment having been made to keep bread in cold storage. It was found that at temperatures from 38° F. to 40° F. the bread was kept for a period of five days without essential change. Director D. D. Mayne, of the University of Minnesota farm, under whose direction the experiments are being conducted, suggests that if the experiments when completed are successful that it would be possible to eliminate a very undesirable feature of the bakers' trade by doing away entirely with night work. It is further suggested that bread, if allowed to stay in cold storage for a few hours or a few days, would be more wholesome than fresh made bread, as the gases developed in the baking would largely be dispelled. There would also be the advantage of having a positive supply of bread always on hand.

In the wheat growing sections of the country there are often occasions when large quantities of the grain will accidentally or otherwise get wet. Un-

less some efficient means of drying this wheat is at hand and quickly applied the grain will spoil. It has been found that, for a cost of something less than 10 cents a bushel, damp wheat may be put into marketable condition by giving it a simple cold storage treatment. This past fall, when the wheat crop was so large, there was a great amount of this wet wheat. It is estimated by those in the trade that, had cold storage facilities been available in the districts where this trouble was prevalent, several million dollars could have been saved to the farming communities.

Mr. H. C. Gore, one of the workers in the Bureau of Chemistry at Washington, describes a process of concentrating sweet cider by freezing which he says will make pure fresh cider available as a summer drink at our soda fountains and should open up a new and valuable market for the juice of surplus apples.

These are but a few of the new uses for cold storage developed within the past year.

Waste.

The primary function of cold storage is to stop deterioration and loss of foods that without it would spoil. That this loss annually is enormous can be readily understood from the figures of Dr. Pennington presented in a previous report showing a $50,000,000 loss in eggs alone. What the loss in other perishables is we do not now know. Your committee is making an effort to obtain this knowledge. The American Association of Refrigeration, through its efficient secretary, has offered to gather for us information of this character. A start has been made but at this writing the data available are too meagre to be of any value. A year from now we shall hope to have some interesting and valuable figures along this line.

Mr. Arthur B. Adams, assistant professor of economics at the University of Oklahoma, has recently written a most interesting book on "Marketing Perishable Farm Products," in which he gives a little information of this character. He says:

"It is estimated that between 20 and 30 per cent. of perishables as a class decay on the farms before they can be sold. At least 25 per cent. of the perishables which arrive at the wholesale markets is hauled to the dump pile because it is unfit for human consumption. In the year 1911 the New York Board of Health condemned and destroyed 6,500,000, pounds of fruit and 2,500,000 pounds of vegetables because of decay. In warm weather, Florida oranges lose 30 per cent. in transportation alone and if we add the decay after the fruit reaches the consuming center the total loss would be astounding. There is a loss of 17 per cent. in eggs from producer to consumer, due to breakage, decay, etc., but butter has an equally great loss. The greater proportion of the perishables which are consumed in the cities are much inferior, because of partial deterioration, to what they were when they left the farms. It is not an overestimate, therefore, to say that between 30 and 40 per cent. of the perishables which are raised on the farms are never consumed at all, but are a complete social loss."

A truly astounding situation which becomes all the more astounding when we understand that the value of the perishables, produced annually, is estimated by the author at $2,100,662. 869, thus representing a loss of from $630,000,000 to $840,000,000, which Mr. Adams believes is underestimated rather than otherwise. He also points out that "only between 5 and 10 per cent. of the total annual production of butter, cheese, poultry, and eggs and a still smaller percentage of the fruits and vegetables, are now placed in storage." And the answer to all this is, for the most part, more cold storage facilities, particularly at the points of production and more refrigerator cars.

Scientific Investigations.

Important work has been done during the past year looking to the improvement of the treatment of certain varieties of perishables while in storage. The United States Bureau of Plant Industry has under way experiments for the purpose of determining the optimum conditions for apple storage. *Farmer's Bulletin*, No. 331 of the United States Department of Agriculture, describes some very valuable and interesting experiments in the precooling and cold storing of cherries and prunes. The prompt precooling of both these fruits is urged as a result of these experiments. These experiments were to a large extent duplicated by the officials of the Canadian Department of Agriculture with equally satisfactory results and with the same conclusions.

Dr. Pennington, in the Food Research Laboratory of the United States Department of Agriculture, has been conducting investigations with regard to temperatures in refrigerator cars. This investigation is still under way. *Farmer's Bulletin*, No. 696 of the United States Department of Agriculture, reports the results of some very interesting and valuable experiments in the handling and shipping of citrus fruits in the Gulf States. "The results of these investigations and the results obtained in commercial plants erected prior to the opening of the 1914–1915 season," says the *Bulletin*, "indicate that precooling is a valuable aid to careful and proper handling in insuring sound condition on arrival and for a period of about ten days after arrival at the market." Further, it was found that oranges keep best at temperatures ranging from 38° F. to 40° F., lemons at 42° F. and grapefruit at 45° F. to 50° F.

These are but a few of the investigations which have been or which are now being conducted. Nothing has been found to indicate that cold storage, under proper operation, has any injurious effect upon perishable foods. On the contrary, where the best methods of treating respective classes of foods have been determined, as is the case with a large part of the perishables cold storage has proven its great usefulness to mankind. Perishable food placed in cold storage in good condition will, when kept under proper conditions, be perfectly sound and wholesome when removed after long periods of time.

Educational.

In our report last year we pointed out the desirability of some educational work for the purpose of more rapidly breaking down the unwarranted prejudice against cold stored foods on the part of consumers and of bringing producers to the realization of the importance of a better handling of their products and a prompter storing of their perishables in cold storage warehouses. While your committee has been unable to take any part in such educational work, there has, nevertheless, been a start made along these lines. The American Association of Refrigeration has undertaken a work of this kind. As one of the first steps necessary for an educational propaganda is basic knowledge of the facts, they have first established a library of the literature bearing on the cold storage industry. A catalogue of this library has been printed and circulated. They have also made a bibliography of the American literature relating to refrigeration and have had this printed in booklet form for distribution. Then they have had prepared a comprehensive booklet giving suggestions to growers and shippers of fruits and vegetables as to the best methods of preparation, loading, stowing, shipping and bracing for safe transportation. Other material is in course of preparation and will be distributed as rapidly as it can be prepared. The effect of this campaign is bound to be widespread and of greatest importance.

The New England Fish Exchange, with headquarters in Boston, has, during the past year, established a publicity bureau and has through the medium of the daily press been educating the consuming public of New England not only to the value of fish as a food but to the important and necessary part which cold storage plays in making this valuable food available in good and wholesome condition at all times. We are informed by the administrative officer of that organization, Mr. W. K. Beardsley, that their efforts are meeting with satisfactory results.

Legislation.

Since our last report the states of Maryland and New Jersey have passed the so-called Uniform Cold Storage Law. The laws as passed contain slight modifications from the original draft as prepared by the Commission on Uniform Laws, but they are essentially the same. The Uniform Law was introduced into the legislature of the state of Louisiana, but was later withdrawn. In the state of Minnesota a law was passed requiring the labeling of eggs held in cold storage for a period of longer than thirty-nine days. The state of Illinois has passed a law regulating the operation of egg-breaking establishments. The most notable thing, however, with regard to laws regulating cold storage is the decision of certain courts with regard to the constitutionality of certain regulations in laws already existing.

The California law requiring the branding of imported eggs has been declared unconstitutional. In Pennsylvania Judge Carpenter has declared that part of the Pennsylvania law plac-

ing a time limit on the storage of certain food products as unconstitutional. In Buffalo, N. Y., Judge Noonan of the City Court has made a similar decision with regard to a similar provision in the New York State law. As both of these decisions are in harmony with what this committee has stated in at least two of its reports, we feel like briefly reviewing these cases at this point.

The Pennsylvania case is known as *Nolan* vs. *Jones, et al.* Nolan is a dealer in butter and as such stores, from time to time, his product in cold storage warehouses. He brought an action to test the question of the constitutionality of the Pennsylvania state law limiting the storage of products to nine months. The defendants are the State Food Commissioner and two or three of his inspectors. The inspectors, acting under the direction of the commissioners, entered the warehouse, found three tubs of butter which had been stored there for a longer period than nine months. Thereupon they placed on these tubs of butter labels which contained the following phrases among others: "Not wholesome; unfit for use as food; not salable for food." No samples were taken and no examination was made to determine the wholesomeness of the product. Judge Carpenter in his decision finds that Section 16 of the Pennsylvania Cold Storage Law, known as the Cold Storage Act of 1913, is in conflict with the State Constitution, Article 1, Section 1, known as the Declaration of Rights, and also is in violation of the 14th Amendment to the United States Constitution, providing that "No state shall make or enforce any law which shall abridge the privileges or immunities of citizens of the United States, nor shall any state deprive any person of life, liberty or property without due process of law, nor deny to any person within its jurisdiction equal protection of the laws."

In discussing his decision, which he does at some length, the judge makes some very interesting statements, some of which are here quoted or summarized. The judge points out that the "Cold Storage Act does not assert that it is based on scientific experimentation or observation." He goes on to say that the time limit might have been cut down to one-half or it might have been doubled. If the act had specified inspection after the time limit imposed and the action of condemnation based on such inspection, then the act might have been found to be constitutional. To sustain the act the judge says that good faith and direct connection with the protection of life and health must appear. In this case he says good faith may be assumed, but appropriate and direct connection with the public health is lacking. In clinching this point he says, "If, therefore, a statute purporting to have been enacted to protect the public health, the public morals or the public safety has no real or substantial relation to those objects or is a palpable invasion of rights secured by the fundamental law, it is the duty of the court to so adjudge and thereby give effect to the constitution." He follows this with the following pertinent remark, "Just wherein the public health is protected or fraud and

deception prevented by authorizing certain state officials to brand a recognized wholesome food product 'not salable for food' without any reference whatever to its actual quality and condition, but solely because it has been preserved in a cold storage house for nine months and one day is not apparent. 'Not salable for food' must be held to mean not fit for food, otherwise we have the state interfering with the private affairs of its citizens without even a pretence of reason for so doing and arbitrarily depriving the owner of the lawful use of his property. And if the words 'not salable' mean not fit deception is not prevented, but is in fact practiced and that by the state. For by its officers and agents it avers as a fact that which may not be true and so far as disclosed in the case at bar is not true." He later calls attention to the decision of the Court of Appeals at New York in the case of the *People* vs. *Biesecker*, which declares the following proposition firmly established: "The legislature cannot forbid or wholly prevent the sale of a wholesome article of food." He closes this very interesting discussion of his decision with this statement, "It smacks of special legislation to declare that an article in common use as food preserved by the best methods known to modern scientific discovery shall be placed under the ban and its owner exposed to prosecution, fine and imprisonment if he offers to sell it as food and yet permits the sale of the same article kept as long as and where the owner may see fit outside of a cold storage warehouse."

The Buffalo, N. Y., case was decided on much the same grounds, but the facts were somewhat different. There are really two cases involved in this decision, but the facts being similar the judge rendered the one opinion. The cases are known as the *People of the State of New York* vs. *Frank K. McFall* and the *People of the State of New York* vs. *Walter A. Tuttle*. Both defendants had stored poultry in the Buffalo Cold Storage Company's warehouse. An inspector from the Health Department visited the warehouse, found the poultry belonging to the defendants and noted that it had been in storage for a longer period than ten calender months, the time limit prescribed by the New York State Cold Storage Law, and began prosecution of the two defendants. These cases differed in one essential particular from the Pennsylvania case, in that the law under which the defendants were being prosecuted was amended so as to cover them after the goods had been stored. In their defense, therefore, they alleged that the act was not retroactive and, therefore, could not cover them until the ten months' period had elapsed after the passage of the act. Whereas the action was brought within five months after the law became effective. They also alleged as a defense that the law was unconstitutional for six different reasons, which need not be named here, excepting that one is identical with that in the Pennsylvania case, namely, that it conflicts with the 14th Amendment of the Constitution of the United States. The judge in his opinion states, "I am of the opinion that both defenses are good and that the defend-

ants must be discharged." Judge Noonan discusses his decision at some length very interestingly. He says, "I think the rule by which the constitutionality of Section 337 of the Public Health Law must be determined is that laid down in the matter *Reade* vs. *Jacobs*, New York, '98, as follows: "When a Health Law is challenged as unconstitutional on the grounds that it arbitrarily interferes with personal liberty and private property without due process of law the courts must be able to see that it has at least in fact some relation to the public health and that the public health is the end actually aimed at and that it is appropriate and adopted to that end. Under the guise of police regulation personal rights and private property cannot be arbitrarily invaded and the determination of the legislature is not final or conclusive." The judge continued, "The section is extremely arbitrary. It prevents the keeping of food in a cold storage warehouse by any person after an arbitrary period of ten months, regardless of the question of whether the food is fit for human use or not. The section is not necessary to protect the health of the public. The other sections of the law, namely, 338 and 338–A, gives the health commissioner all needed power to protect the public in its use of products in cold storage. These sections give the health commissioner complete power of supervision and inspection and the power to destroy food that is unwholesome. What more is necessary? If that part of the rule laid down in the Jacobs case, namely, 'and that the public health is the end actually aimed at' is still good law the section in question must be declared unconstitutional, because its real purport is not to protect the health of the people by seeing that unwholesome food products are not put upon the market, but its real reason for being is to force upon the market any products that any person may have in cold storage after a definite length of time and thus force the owner thereof to sell when the market is unfavorable and generally at a loss." Commenting on the fact that the condemnation was made solely on the grounds of the time limit and not on the condition of the goods the judge remarked, "The state offers no evidence upon the question of fitness. The overwhelming proof on the part of both defendants in question was that the food was absolutely wholesome. Evidence was introduced showing experiments that had been made with great care by the Health Department of the City of Buffalo which showed that poultry kept in cold storage was absolutely wholesome long after ten months. I do not think that the state can successfully contend that poultry properly kept in cold storage is unfit for use in ten months." Judge Noonan then summarizes his remarks and in this summary makes the following statement, "The statute is further unreasonable and arbitrary in that it makes it a penal offense to keep stuff in cold storage, where it can be kept with the greatest safety, and yet permits it to be kept by a man in his own icebox or any place that is not a storage warehouse for an indefinite length of time."

These two decisions are so in line

with the previous reports of this committee on this particular point of time limit that we have a strong feeling of remarking, "I told you so."

Another attempt has been made to pass a federal cold storage law which will embody the same objectionable time limit regulation. This bill was known as the Carey Bill. But strong opposition developed to it, however, while it was in committee and it was quietly pigeon-holed and no great effort was made to pass it.

Aside from the cold storage bills which passed and which have already been noted, there were several introduced in various state legislatures which never proceeded beyond the committee hearing stage. In every case where your committee learned of the intended legislation the reports of the cold storage committee were forwarded to the introducers of the bills and to the chairmen of the committees having charge of them. Such information as the committee had available was offered to these individuals. We believe that legislation on this important subject of cold storage is likely to be of a much saner character hereafter than some of the earlier attempts at the regulation of this industry.

Conclusion.

Your committee in concluding this progress report, while realizing the narrow limits in which it may be useful because of the fact that it is without the time or the funds to prosecute some definite line of research work or an educational campaign, desires nevertheless to urge that a similar committee be appointed to continue such work as is possible and to lend its encouragement and help to those who are in a position to carry on the work which we see is desirable and urgent. We gratefully acknowledge the coöperation and assistance given us by Dr. Pennington of the Food Research Laboratory, United States Department of Agriculture, the American Association of Refrigeration, the New England Fish Exchange, Ice and Refrigeration, and many others.

Respectfully submitted,

Wm. T. Sedgwick,
J. F. Nickerson,
Peter H. Bryce,
H. E. Barnard,
F. D. Bell, *Chairman*.

MASSACHUSETTS ASSOCIATION OF BOARDS OF HEALTH.

THE annual meeting of the Massachusetts Association of Boards of Health was held at the Brunswick Hotel Thursday, January 25, 1917, with the president, Dr. Frank A. Woods, in the chair.

It was voted to dispense with reading the records of the preceding meeting.

The treasurer, Dr. Francis G. Curtis, presented the following report which was accepted and placed on file:

MASSACHUSETTS ASSOCIATION OF BOARDS OF HEALTH *in account with* FRANCIS GEORGE CURTIS, *Treasurer.*

DR.

Balance from 1915	$562.66
Dues for 1914	4.00
Dues, etc., for 1915	52.00
Dues, etc., for 1916	432.50
Interest	16.64
Total receipts	$1,067.80

CR.

Printing for secretary	$60.87
For treasurer	37.00
For Committee on Incorrigible Consumptives	21.00
For Committee on Communicable Diseases	2.50
Reporting meetings	47.50
Expenses of speakers	21.33
A. P. H. A. JOURNAL	345.69
Total expenses	$535.89
Balance to 1917	531.91
	$1,067.80

Respectfully submitted,
FRANCIS GEORGE CURTIS,
Treasurer,
Massachusetts Association of Boards of Health.

On recommendation of the Executive Committee the following applicants were admitted to membership in the Association:

Dr. D. B. Armstrong, Framingham, Mass.

Miss Mae Chapin, R. N., 561 Massachusetts Ave., Boston, Mass.

Miss Helen B. Fenton, R. N., 561 Massachusetts Ave., Boston, Mass.

Dr. Francis A. Finnegan, Fitchburg, Mass.

Dr. A. G. Gigger, State Department of Health, Providence, R. I.

Dr. Thomas F. Harrington, 310 Commonwealth Ave., Boston, Mass.

Mr. Everett B. Johnson, 26 Phillips St., Watertown, Mass.

Mr. Stephen L. Maloney, City Hall Annex, Boston, Mass.

Mr. J. J. Prindiville, 59 Concord St., Framingham, Mass.

Mr. Seymour H. Stone, chairman of the Committee on Incorrigible Consumptives, reported as follows:

"The committee has presented to the legislature two bills similar to those submitted last year; one giving local boards of health the power to bring into court for commitment to the proper institution of a wilfully careless and incorrigible consumptive; the other to provide for a special institution for such persons.

These bills have been assigned to the Committee on Public Health of the legislature and are numbered House Bills 74 and 75.

The bills have been printed and about eight hundred sent to organizations and individuals, throughout the state, interested in the tuberculosis problem.

Mr. Stone further stated that last year the bills similar to these were not reported out of the Committee on Public Health of the legislature. Of the eleven members on this committee four voted in favor of the bills, three of the four being physicians. More active support on the part of those favorable to these measures is greatly needed. The members of the Association who wish to see these bills made law should make their wish known to the members of the legislature from their districts and, if possible, should attend the committee hearings on the measures.

Dr. L. E. Dionne of Ware submitted an amendment to Section 405 of Revised Laws 75 regarding the composition of boards of health in towns of a population of 5,000 or more, said amendment to require two physicians instead of one on the board. By a vote of the Association the matter was referred to the Legislative Committee.

Dr. G. L. Tobey of Clinton, chairman of the Legislative Committee, presented a report which was accepted.

It was voted that the Association authorize the Legislative Committee to employ legal counsel as heretofore and that the sum of $150 be appropriated for that purpose.

On motion of Doctor Tobey the chair appointed a committee of three, Dr. F. G. Curtis, Dr. A. S. MacKnight and Dr. E. Alden Dyer, to draw up resolutions in relation to anti-vaccination and other legislation and this committee presented the following resolutions which were unanimously adopted:

Resolved, That the Massachusetts Association of Boards of Health is opposed to any change in the present laws in regard to vaccination and that the Legislative Committee of the Association be, and is hereby, directed to oppose any legislation which may tend to modify the same.

Resolved, That the Legislative Committee of the Massachusetts Association of Boards of Health be, and is hereby, directed to favor the passage of House Bills 74 and 75.

The Nominating Committee reported in favor of the following candidates for office during the ensuing year and they were unanimously elected:

President, Dr. Francis X. Mahoney, Boston.

First Vice-President Dr. John S. Hitchcock, Northampton.

Second Vice-President, William G. Kirschbaum, New Bedford.

Secretary, Dr. Francis H. Slack, Boston.

Treasurer, Dr. Francis George Curtis, Newton.

Executive Committee:

Mr. William L. Young, Springfield.
Mr. Charles W. Milliken, Barnstable.
Mr. Fred A. Bates, Lowell.
Dr. F. L. Morse, Somerville.
Dr. Gardner T. Swarts, Providence.

The following program was presented:

Paper:—"The Community Health and Tuberculosis Demonstration in Framingham," by Dr. Donald B. Armstrong, executive officer, Community Health Demonstration.

Discussion.

Paper:—"Industrial Health," by Dr. Thomas F. Harrington, medical deputy commissioner State Board of Labor and Industries.

Discussion.

The meeting was then adjourned.

FRANCIS H. SLACK,
Secretary.

THE FRAMINGHAM HEALTH AND TUBERCULOSIS DEMONSTRATION.

D. B. ARMSTRONG, M.D.,
Assistant Secretary of the National Association for the Study and Prevention of Tuberculosis, and Executive Officer of the Framingham Health and Tuberculosis Demonstration.

IS IT possible to discover and to place under adequate medical, nursing and relief supervision all of the cases of tuberculosis, incipient and advanced, in a normal industrial community?

Is it possible to ascertain with some degree of definiteness the responsible social and economic factors in disease causation, including all types of morbidity, not only tuberculosis?

What is the most efficient utilization of the existing means available for the discovery and treatment of disease? What percentage of theoretically preventable disease is practically preventable with the use of known but unused or at least uncoordinated instruments? What is the best possible adjustment of social forces, existing or to be created, with the objects of the prevention of unnecessary disease and death?

Such, in brief, are the fairly ambitious questions which Framingham is attempting to solve. If the community is the logical social unit for disease prevention and control, and if the time is right for the application of a complete program for disease prevention and health creation, there is every reason to hope that, in some degree at least, answers to the above questions may be demonstrated. Obviously, the problem is not only one of tuberculosis and not only a health problem; fundamentally it is a problem of social and economic organization.

As announced in the papers and elsewhere, the Framingham Health and Tuberculosis Demonstration is being conducted under the supervision of a committee organized by the National Association for the Study and Prevention of Tuberculosis. On this committee are represented the National Tuberculosis Association, the Massachusetts State Department of Health, The United States Public

Health Service, private anti-tuberculosis organizations in Massachusetts, Connecticut, New York and Pennsylvania, and the Metropolitan Life Insurance Company, the donors of the $100,000 to be devoted to the work.

The selection of Framingham was made after several months' study of numerous communities of similar size in various parts of the United States, but particularly in Massachusetts and New York State. Framingham recommended itself to the committee because it possessed certain average qualities, being an industrial community, with mixed industries, varied racial groups, a good local health organization backed up by an excellent State Department of Health, a normal amount of disease, particularly tuberculosis, well trained physicians and good hospitals, and sufficient promise of coöperation from medical, industrial, commercial and social organizations to give reasonable assurances of success.

As indicated above, the objects of the investigation are to demonstrate what may be possible with united community action in the problem of prevention and control of tuberculosis. Inevitably the experiment, if it goes forward as planned, will broaden out into a general health demonstration concerning itself with the various disease preventive problems as they affect the several age groups, and utilizing in its effort at control all potential agencies, social, industrial, educational, medical, etc.

Briefly stated, the essentials of the demonstration, as viewed by the committee, are as follows:

1. The sympathetic coöperation of all individuals and organizations, public and private, in Framingham.

2. The execution of the program on an educational, persuasive, and democratic basis, social machinery being devised to carry the various elements in the community organization along with the work as it progresses.

3. The utilization of expert advisory service whenever feasible. This principle applies of course to general sanitary, medical, nursing, educational, school or industrial problems.

Before this audience, in presenting in the time allowed for this discussion the important phases of the program, special attention must be paid to the medical and health aspects of the plan. Consequently, only the briefest mention can be made of other significant steps.

It is of course essential that for the work a sound statistical basis be laid, involving the acquisition of data, making possible a comparison of existing conditions with conditions during the subsequent years of the demonstration, as well as a comparison between the existing conditions in Framingham, now and later, with similar conditions in other communities of similar make-up, thereby furnishing what in a sense should prove to be a control for the experiment.

The initial steps contemplated include the following:

1. The carrying out of a thorough and intensive campaign to acquaint the citizens of Framingham with the objects and methods of the demonstration, laying special emphasis on those phases of the program which

depend for their success upon the cooperation of the individual citizen. This educational work would naturally lead to efforts to present the main facts on hygienic living, prevention of disease, particularly tuberculosis, etc., the educational campaign culminating eventually in a general propaganda for thorough, universal, medical examinations for the detection of incipient and preventable or controllable cases of disease.

2. The organization of local committees of a medical and lay character, to coöperate in and advise regarding the work as it proceeds. The plan contemplates not only the organization in this way of leading influential citizens, but also the general selection, possibly on a block basis, of community leaders who will act as agents of interchange between the people themselves and the central committee.

3. An effort to encourage the Framingham health authorities to meet, through their own appropriations, the logical and legitimate routine health needs of the community, such as public health nursing, medical school inspection and nursing, general health administration, etc.

4. The efficient coördination of public and private health and charitable work.

5. A thorough study of community conditions, covering the general sanitary, rural, industrial, school, commercial and office factors, thus assisting the committee in its effort to make a diagnosis of the community health problem, and supplementing the intensive canvass to be made subsequently.

For a complete and successful use of available community agencies, it is obvious that certain mutually beneficial and coöperative relations must be established with the health and medical representatives in Framingham. On the side of health and nursing, the problem in Framingham presents no unusual difficulty. The board of health, with the assistance of private agencies, can, with minor adjustments, meet the routine nursing needs. Any extraordinary or experimental nursing or health needs essential to the working out of the program in Framingham will of course be met from the demonstration fund.

Incidentally, it may be mentioned that the demonstration budget includes funds appropriated for extra nursing service, for payments to physicians when making thorough medical examinations, for assisting town and private agencies in the provision of adequate medical nursing and relief care for both home and institution cases, etc.

In Framingham, as probably would be the case anywhere, the problems of medical organization are most fundamental and at the same time perhaps most difficult. The success of many phases of the program, including thorough medical examinations, the detection of early cases of disease, etc., depends upon the sympathy and help of the members of the medical profession. Their criticism and approval of numerous steps must be had. Uniform diagnostic standards and methods for the examination and classification of disease are essential to the scientific value of the demonstration. Not only

early cases of disease, but suspected and undiagnosed cases must be gotten in touch with and classified, with the assistance of outside expert medical service. The medical work must always be done through the practicing physician, in such a way as not to interfere with the normal medical procedure, except in so far as innovations would give assurances of a higher degree of medical efficiency, and greater uniformity in methods of diagnosis and treatment.

A local organized medical agency is necessary to meet these ends. Such a medical group, or club, including in its membership all of the practicing physicians on a common basis of cooperation and service, will prove to be a useful piece of community machinery in the adoption of standards, confidential reporting of suspected cases, the use of expert diagnostic service, the approval of popular educational material on hygiene and preventive medicine, etc. Perhaps the chief function of such a medical club will be the development of a course of lectures and clinics, given by the country's first authorities, on tuberculosis and other problems of interest to the Framingham medical profession, placing special emphasis on the detection of incipient disease.

If the campaign to urge the people to go to their doctors for thorough medical examinations is a success, here again the intelligent coöperation of the Framingham physicians will be needed. Such a step of course is not contemplated in the immediate future, but would follow an initial effort to give complete care to known cases of tuberculosis, as well as any other obvious cases readily discovered through the examination of individuals in contact with known cases. In a thorough medical survey of the community, however, certain other problems will arise, if the work is to be done on a uniform basis and if it is not to be an excessive burden upon the practicing physician. The citizens of Framingham will of course be urged to pay what is determined to be a satisfactory fee for the thorough examination. If, however, any members of the community are willing to be examined, but will not meet the expense themselves, this would undoubtedly be considered a legitimate expenditure for the demonstration fund.

A thorough medical survey would necessitate the expansion of existing laboratory facilities. The health department laboratory, now doing, with the assistance of the State Laboratory, routine epidemiological work, could perhaps provide facilities for the more ordinary types of clinical laboratory work as well. Many individuals would also be discovered who would fall strictly in the dispensary class, and to meet that need, the existing tuberculosis dispensary might perhaps be expanded to include a general medical service, with an open alternating medical attendance, not only for adults but possibly for school children and factory groups. Such a service might even be placed on a pay, self-supporting basis and if such a clinic could be developed along the lines indicated, including not only tuberculosis, general medical, school medical and perhaps dental, but also infant welfare service,

there would be created in the community a *health center* truly worthy of the name.

A final criterion of the success of the experiment will be, of course, the condition existing in health and medical circles, subsequent to the withdrawal of the demonstration staff. It is hoped, of course, that there may be established eventually an ideal and adequate health machinery. As a demonstration to other communities this would seem to be an essential.

Obviously, the immediate results of such a program as is briefly outlined above, if successfully carried out, would include not only a direct benefit to Framingham, but ought to involve a demonstration of the economy and social value of united community organization to meet the problems of preventable disease. It ought indeed to throw considerable light upon the most efficient methods for meeting health questions in school, factory and elsewhere. It ought also to be significant, perhaps, in its bearing upon the future of medical service in general.

The Framingham Health and Tuberculosis Demonstration welcomes your inquiries, suggestions and criticisms, standing as it does as a unique and unprecedented effort in democratic health creation. It is hoped that the work may point the way to the establishment of a hygienic basis for social organization, a physical foundation without which social, economic, and, indeed, spiritual evolution is bound to be abortive

INDUSTRIAL HEALTH.

THOMAS F. HARRINGTON, M. D.,
Medical Deputy Commissioner, State Board of Labor and Industries.

Read before the Massachusetts Association of Boards of Health, Boston, January 25, 1917.

INDUSTRIAL health is a most complex problem. It touches many interests,—medical, sociological, economic, philanthropic, scientific, as well as insurance, compensation, pensions and legislation. Modern civilization, the wonderful development of machinery and apparatus, the evolution of new industries and the transformation of old processes of manufacture have combined in bringing about such a changed condition in the environment, life and habits of the industrial workers that the whole social fabric has become involved. Social life and living conditions increase rather than lessen the appalling sacrifice of health, limb and life prevailing among those engaged in the industries. An accounting of this great loss has just been begun in this country, and many legislative bodies are deliberating seriously upon ways and means to distribute best the cost. Attempts have been made recently to consider in dollars and cents this economic loss due directly or indirectly to industrial conditions. The magnitude of this economic waste—thus computed—is almost beyond

understanding. While such statistics may have some value as an argument in awakening the public to a better realization of this great wastage, nevertheless, we should not forget that the problem is one of human life and happiness—factors that cannot be expressed in dollars and cents. Furthermore, the loss is a personal one, either individual or family. No compensation, no insurance, no pension, however generous, can ever recompense for the loss of the husband and father, for the days of illness and suffering, for the discouragement, worry and discontent resulting from causes that are preventable and avoidable. Let this threatened loss affect one of our own family and how readily we make every effort to avert the blow! It is because of the growing tendency today to speak of this loss in terms of economics, collectivism, and materialism that I would urge greater consideration to the humane, the justice and the preventive aspect of the problem.

Prevention should be the keynote of all efforts to promote industrial health. There is an abundance of reliable experience and testimony to warrant the belief that a great part of the industrial sickness and a large number of deaths among industrial workers can be prevented. The complete eradication of phosphorus poisoning in the match industry in this country, of white lead poisoning in the painting trades in Europe, and the reduction of occupational diseases, injuries and deaths, where preventive measures have been followed, show some of the possibilities of this form of education against industrial human losses. The reason why these measures have not been adopted more generally in the industries is due to many causes. The chief reason, however, is probably the almost total neglect of the problem in this country. Manufacturers looked to the medical profession for leadership in such a campaign. Physicians have not been prepared for such a responsibility. Practically all our medical teaching and practice during the past forty years,—a period of unprecedented growth and development of industrial organizations—have been based upon the germ theory of disease. None of the industrial diseases—except anthrax—is due to microorganism. These diseases are due to gases, fumes, vapors, chemical poisons, dusts of various kinds, overheated workshops, stagnant, dry or overheated atmosphere, defective lighting, lack of toilet, drinking and washing facilities, overspeeding, low wages, fatigue, job misfits, and other causes—social, economic, physical. They are not—*per se*—communicable nor dangerous to the public. State Boards of Health, having the enforcement of factory sanitation, centered attention chiefly about tuberculosis—a disease not strictly occupational in origin. Later it was observed that the increase of the mortality rate is principally among diseases of the heart, circulation, kidney and nervous systems, diseases clearly outside the communicable group and markedly prevalent among industrial workers. Whether this increase is due to industrial conditions chiefly can be learned only by further special study

of the various industries, and from a more accurate knowledge of the morbidity of each branch of occupation.

The failure of the medical profession to include a knowledge of occupational environment in searching for the cause of many common as well as of baffling diseases is almost paradoxical in view of the advances made in preventive medicine and hygiene. The industrial workers, however, seeing at close range the ravages of many of these diseases among their fellow-workmen have succeeded in having enacted into laws many provisions for their own safety and for protection against conditions inimical to health. In Massachusetts this activity crystallized in 1912 into the creation of a separate state department for the enforcement of all labor laws, including those for the protection of the health of the worker in the industries, and for safeguarding against accident and injury. The work of the State Board of Labor and Industries touches at many angles the work of health boards, educational boards, public work departments as well as the work of practicing physicians. To accomplish anything worth while in the prevention of industrial sickness and accidents, or in the reduction of the present day wastage of human life and happiness among industrial workers there must be honest coöperation between all these forces. There need be no overlapping, nor duplication. There should be no misunderstanding, nor antagonism. It is no exaggeration to say that if all forces united in the humane and reasonable enforcement of labor—health laws—now on the statute books in Massachusetts, there would result a reduction in sickness, loss of life, and of poverty in this state, and a corresponding increase of happiness, efficiency and contentment far beyond the dream of the most optimistic advocates of the value of preventive medicine or social betterment.

A few illustrations may bring out clearly the possibilities of such cooperation. In 1906 a law was passed requiring the physical examination each year of every pupil in the public schools of the state. This examination specifically calls for the testing of the vision and of the hearing. In 1913 a law was enacted requiring each child between the ages of fourteen and sixteen years seeking employment to present a certificate signed by a school or family physician, or by a physician appointed by the school committee, stating that the child has been thoroughly examined by said physician, and, in his opinion, is in sufficiently sound health and physically able to perform the work which the child intends to do. Obviously, the aim and purpose of these laws were the preparation of the child for his future occupation, and secondly to prevent misfit of child and occupation. There are at the present time more than fifty thousand minors under eighteen years of age in the industries of Massachusetts. It is probably too soon to expect any marked improvement in industrial health from the workings of these laws. The possibilities, however, of making these early, regular, physical examinations a positive factor for better health in later years needs no argument. The

value of good eyesight, unimpaired hearing, and a keen, active sense of coördination of nerve and muscles, was never greater than it is today. A new phrase—human efficiency—has been coined to standardize the co-efficiency of the worker with the demands of modern industrial evolution. Medical supervision of school life should mean the elimination of many defects and handicaps that are today positive obstacles to success in vocational life. With such a preparation for the industrial world the individual worker would be better equipped to meet its exacting requirements. Failures and physical shipwrecks at such an early age would be far less common than these conditions are today. Until some such standard of health is guaranteed it is neither fair nor just to charge all the present day industrial sickness to the occupational environment. There are many establishments in which hazards to health are practically *nil*, yet the number of debilitated persons surprisingly large. In other words, sickness among industrial workers is not always the same thing as sickness caused by industrial conditions. The responsibility of guaranteeing to the industries healthy recruits to the army of wage earners should be fixed definitely. Today school inspection is divided between local health boards and school authorities. The work should be centralized and standardized. The possibilities of the school hygiene branch of preventive medicine in promoting health are very great. Laws now on the statute books offer an exceptional opportunity for team work that should promise most satisfactory results in health conservation.

Another point of contact where co-operation of local boards of health and the State Board of Labor and Industries would result in much good is in the collection of reliable statistics on morbidity and mortality among industrial workers. There are no authentic data today on these subjects. Much of the statistics confuse industrial accidents, occupational diseases and sickness due to non-industrial conditions. Local boards of health are in a position to aid greatly in establishing a scientific basis for industrial morbidity and mortality.

As I look back over my experience as chairman of a local board of health in this state I recall the time and money spent in the inspection of house plumbing in our hunt for the cause of typhoid fever. I feel sure that if the inspectors had been employed in tracing back step by step the occupational hazards that lead eventually to the deaths reported from tuberculosis, arterio-sclerosis, apoplexy, heart disease, kidney diseases, nerve and mental diseases, as well as blood and digestive disturbances, there would be found in every such case a stage of ill health at which a word of caution about lead poisoning, dust infection, fume irritation, overspeeding, change of occupation or a readjustment of work to fit the physical condition would have resulted in a long postponement, if not entire avoidance, of many premature deaths. I am equally positive that the information gained by such a "follow up" would have brought me face to face with conditions of living

and of occupational environment that would have made it possible to institute preventive measures that would have reduced greatly sickness, suffering, poverty, unemployment and unhappiness among thousands of fellow workers. The death return blank used today calls for a statement by the attending physician as to the contributory cause as well as the primary cause of death. By insisting that physicians furnish this information, the boards of health would establish a starting point for a basis of a comprehensive cataloging of occupational factors in morbidity and mortality of individual workers and group of workers. It would stimulate a closer study by physicians of the occupational life and duties of their patients and would create a new classification of the ætiology of many diseases. The occupational origin of many diseases would be found to be as surprising as many of the revelations of modern bacteriology and pathology. Until physicians acquaint themselves with the actual physical requirements of different branches of occupational life, and with the health hazards inherent in the various industries, the decision of the examining physicians as to the fitness of minors to enter these vocations must be more or less of a hit or a miss. To pass a girl who is defective in vision or in hearing into such an occupation as telephone operator, stenographer, sales clerk, etc., is sending her to certain failure. To sanction the entrance of a rapidly growing boy, anæmic and glandular, into an occupation of indoor life is as tragic sooner or later as permitting the epileptic boy to take up the occupation of elevator operator or automobile driver. Various labor laws have placed many safeguards against minors entering specified occupations. These prohibitions, however, are based upon the age and not upon the actual physical fitness of the boy or girl seeking employment. The State Board of Labor and Industries is prepared, by reason of its many inspections of industrial establishments each year, to coöperate with physicians, sanitarians, school and health officers in establishing standards of occupations and risk so that the worker and the work may yield greater profit of health and wealth,—the only true measure of production of labor.

In the requirement that physicians report occupational diseases to the State Board of Labor and Industries there is much need of greater appreciation by the medical profession of the great importance of this law. Several instances could be quoted illustrating the advantage to workers, employers, and to the community that have occurred within a year in this state from the information gained through this law. A few illustrations will bring out more strikingly this advantage:

A report called attention to a death from what was alleged to be arsenic poisoning contracted in handling leather. An autopsy was secured and a post-mortem diagnosis of anthrax returned. An investigation showed that the man had worked in the hold of a vessel laden with dried blood, ground bones and phosphate, and had subsequently assisted in unloading a cargo of hides. The hides were

traced to a tannery, where it was learned that hides were being imported from infected districts in China, India, Africa, Brazil and Argentine. These cargoes formerly went to England. Instructions to local physicians and tannery operators resulted in the detection of some thirty cases of anthrax with seven deaths during the year. The seriousness of this outbreak is evident when it is recalled that England has found it necessary to maintain for several years a permanent commission on anthrax. The average number of cases of that disease, however, in England from all sources—infected wool, horse hair, hides, skins, etc.,—is thirty-five, with an average death of six or seven cases a year. An active coöperation was established between the State Board of Health and the State Board of Labor and Industries, which has resulted in a more rigid and systematic disinfection of all imported hides, and a closer watch over interstate transportation. The investigation brought out further the fact that there is no law protecting against interstate transportation of infected hides. A set of rules and regulations has been issued by the State Board of Labor and Industries, setting forth the causes, sources and prevention of anthrax. These activities have resulted in a better knowledge of this disease and have been the means of improving greatly the working conditions in tanneries and leather factories.

Another group of serious conditions brought to light through reporting occupational diseases was gas and fume poisoning:

A chemical manufacturing company recently established in the state for the preparation of benzene derivatives, such as nitro-toluene, trinitro-toluene, nitro-benzol, phenol and picric acid attracted the attention of the board through a report that an employee had died because of some mysterious poisoning. An autopsy was secured and a diagnosis of accidental gas poisoning returned. By a coincidence a second employee died the following day. An autopsy agreed in its findings with the previous case. Neither case had been reported antemortem because the interval of two or more days of apparent good health between the attack of the illness at the works and fatal termination seemed to exclude gas poisoning as the cause of death. This misleading interval of good health is one of the characteristic signs of poisoning by the benzene derivatives that were being manufactured. The interest created among local physicians and hospital authorities by these cases, and their investigation, has resulted in a collection of reports of occupational diseases due to benzene derivatives and other gases and fumes not heretofore available in this country. Some of the cases are not mentioned in American textbooks on occupational diseases. Forty-five cases with thirteen deaths have been reported during the year. Rules and regulations for the prevention of poisoning by chemical agents of this nature have been issued by the State Board of Labor and Industries to the various establishments where chemicals, dyes, gases and explosives are being manufactured or handled.

These rules include medical supervision, hospital accommodations on the premises, suitable first aid rescue apparatus, etc.

The construction of subways in Boston brought into prominence caisson disease, resulting from working in compressed air. The first case was a non-English-speaking Italian, who was taken ill on the street car. He was semi-delirious and was thought to be intoxicated. His pain was agonizing. The conductor took the man to the hospital; large doses of morphine failed to relieve his suffering. The police reported that the man worked on a subway job. Inquiry at the tunnel demonstrated that cases of bends were common and the workmen accepted the disease as a necessary part of their occupation. Conference resulted in placing the work under strict medical supervision, including a thorough physical examination of the men and the establishment of a suitable decompression medical lock for the immediate treatment of the men attacked by the disease. A set of rules and regulations governing working conditions under different degrees of compressed air has been adopted, since which time there has been an almost entire freedom from serious illnesses among the workers. Thirty-five cases of caisson disease have been reported during the past year and a half.

Many interesting illustrations of the value of reporting occupational diseases could be furnished, if time permitted, from the list of cases of lead poisoning, brass poisoning, wood alcohol, occupational neuroses, dermatitis, etc., that have been accumulated during the past year. Sufficient has been presented to make it clear to even the most skeptic that occupational disease is a real problem in industrial health.

The last point that I would emphasize, touching coöperation of local boards of health and the State Board of Labor and Industries, is what we have termed "Rules and Regulations for Toilets in Industrial Establishments." These rules have all the force of statute. They define specifically the requirements as to number of toilets for each sex, and location, ventilation, lighting, construction, etc., of toilets as well as the requirements for washing facilities. The enforcement of these rules is doing much to relieve communities of the privy type of closet, and of river and stream pollution. There is, perhaps, no one factor that makes for better industrial health than the adequate, suitable and convenient facilities for toilets and for washing in the workshop, the factory and the store. Of like importance is the question of a supply of pure drinking water, especially in overheated and dusty workrooms.

The foregoing represents some of the opportunities for the coöperation of agencies having for their object the promotion of individual as well as of community health.

To secure for the great army of wage earners in this state some degree of industrial health is the duty and the responsibility of no one department nor individual; it is a work of humanity and justice in which all can share.

DISCUSSION.

Professor Sedgwick: I am very glad that Doctor Armstrong has brought this interesting paper before the Association. It is a matter of pride for us all that the first place chosen for such an experiment should be in Massachusetts, and it is of vital importance to Doctor Armstrong that the closest possible coöperation should exist between his work and our state, municipal and town boards of health. The experiment will be watched with the keenest sympathy and I am sure that every member of this Association will do his utmost to make it successful.

It is easy to attack a new undertaking; there are always an abundance of "knockers" and critics, but I believe the promoters of this interesting attempt to control tuberculosis in one community may be assured of the cheerful and hearty coöperation of the Massachusetts Association of Boards of Health.

Tuberculosis is always with us and for that reason it is tolerated. We have become accustomed to it, and because it is not more frightful, because it does not assume such terrible aspects as Asiatic cholera or the plague we tolerate it. It is the good (?) old-fashioned consumption of which our ancestors died, and with which, perhaps I ought to say, they unfortunately lived.

We tolerate it, and this very tolerance is one of the hardest things we have to deal with. Now in a Massachusetts community we are going to try to educate the people to intolerance of tuberculosis. It is all mighty interesting and we are all going to watch the experiment with the greatest interest, and help it all that is in our power.

I was also interested in Doctor Harrington's paper dealing, as it does, with a subject of so much importance to a state where so many people are engaged in industrial pursuits.

I have an axiom that "every industry should sanitate itself,"—that is, it should take care of its workers and its waste products in such a way that there would be from them no menace to the public health. I believe we ought to extend this idea to cover the wage earner and require that every industry should help to keep its workingmen in reasonable health. If an industry cannot sanitate itself it is a question if it should be tolerated. It is time we had a higher state of industrial health, and the State Board of Labor and Industries is, I believe, doing good work along this line.

Doctor Dionne, *Ware:* I would beg leave to relate a case which came under my observation and which may serve to illustrate the need of the work so ably described in Doctor Armstrong's paper.

A few weeks ago a man 26 years of age called at my office. He was married man with one child; with a wife in advanced pregnancy. He came to Ware from Hartford and he told of the amount of money he had spent to get a cure for the chills he suffered from and which he termed "malaria chills." He had visited the X-ray men mostly and said that he paid them over $150, and that all had envied his "strong lungs." Albeit, I found him to be in the last stage of pulmonary tuberculosis. He was without means, he had worked to that very day, and as he was a state case, I tried to have him admitted at the Rutland Sanatorium, but I found he would have to be placed on the waiting list, and as his condition was too urgent to wait for formalities I consulted with Doctor Perry of the Hampshire County Sanatorium and through his genial spirit of endeavor, I obtained immediate admission for my patient. Exactly five weeks from the date of admission he died.

Now this poor man, for nine months prior to his death, worked in one of our largest manufactures and his condition was not discovered. It could probably have been easily detected at least two years before and his misery diminished if his life could not be spared.

I was under the impression that the state inspectors were supposed to be on the lookout for such conditions and that they were not allowed to exist.

On the industrial side of the question I say that one of the oldest principles of philosophy is *primo vivere*. The obligation of living first imposes itself more forcibly upon those who feel that their loved ones depend on their daily labor for daily bread, and it is lamentable that so many must work on such inadequate salaries. Before we can do much to conquer tuberculosis

we must obtain living wages for the men who toil. When a man has to support six or eight children, his wife and himself on a salary of less than $12 per week he must look for the quantity rather than quality in his selection of food and he unwillingly prepares the ground for tuberculosis. A man should not be required to work until within six weeks of his death when he is suffering with a pathology so chronic as tuberculosis, and this is true for his own good as well as for the protection of his associates. Such a person will cough and expectorate to the danger of others and the employer should be obliged to report such cases to proper authorities. My case marks one of the occupational misfits so masterly elaborated by the last reader.

It is also deplorable that it takes so much time to enter a tuberculosis patient into a state sanatorium. My patient was a state case and yet he had to be placed in a county sanatorium, at a loss of two dollars per week, as the state subsidies cover but $7 weekly.

Doctor Voss, *Beverly:* I agree with the previous speaker that a living wage for industrial workers is of the greatest importance. We all know that tuberculosis is a disease of malnutrition and that it is fostered by conditions of poverty and want.

The loss of life through preventable accidents and through preventable disease is frightful.

In arsenical poisoning, lead poisoning, mercury poisoning and phosphorus poisoning it is very easy to place the blame where it belongs, but in tuberculosis it is a question how much of a factor in the causation of the disease the industry is.

One thing is certain, we must have a radical change in the living condition of the families of many of our workingmen before we can progress far in stamping out tuberculosis.

Doctor Harrington: In answer to Doctor Dionne's question as to the duties of state inspectors, I would say that minors employed in industries may be examined whenever it is deemed advisable or necessary, and the inspector shall call the ill-health or physical unfitness of any minor to the attention of his or her parents or employers and of the State Board of Labor and Industries. In the case of adults, however, there is no jurisdiction, except the general jurisdiction of the board of health over tuberculosis and other communicable diseases.

Book Reviews

Public Health Nursing. *By Mary Sewall Gardner, R. N. The Macmillan Co. New York. 1916. Pp. 364. Price, $1.75, net.*

To all actively engaged in the public health work of today, whether in an advisory, executive or subordinate position, there come hours and seasons when the intricate mass of detail weighs heavily, when political, financial or sociologic difficulties confound and exhaust and when one's true relationship to the work and community, of theory to unit seem hopelessly obscured.

Especially is this true of those branches of the work, in which development has been most rapid and rich in promise. No agency at the command of the sanitarian, has undergone such rapid evolution as has that designated in the title of Miss Gardner's work. For this very reason the busy executive, the army of nurses themselves, to say nothing of the public for whom the work is done, have too frequently lost sight of the significance of the movement.

To some—the few—it has come simply as a natural outgrowth of the increasingly prominent part that woman, today, is playing in public affairs. Others have been quick to realize its true and correct relationship to modern preventive medicine, unit responsibility, and hence individual knowledge and coöperation versus legislative or police control. The public health nurse has, more than any other agent, fostered the new public health and in the clarity that she has brought to departmental and community relationships, she has served to demonstrate the soundness or unsoundness of many health tenets of our time.

In "Public Health Nursing," the author has presented a masterly concept of the sphere of the nurse in health organization. She has, however, done much more than this, she has visualized, to even the most casual reader, the best in health endeavor.

In the two chapters devoted to the history of public health nursing she has wisely selected the significant only, from a mass of material that afforded every temptation for too lengthy treatment.

The basic principles of the movement are clearly defined and the difficulties in the way of the most efficient execution are most impartially handled and in such wise as to temper hasty conclusions and stimulate just consideration and further inquiry.

Full of wise counsel is that portion dealing with the organization of health nursing activities and it is a safe statement that these chapters furnish the most practical assistance to all contemplating the establishment of such health agencies.

The chapters on the special branches of public health nursing, while not burdened with needless detail, are full of stimulation both to the student and the executive and form a valuable placement of each subject in the whole of sanitation.

No portion of this work, however, is more striking or valuable than Miss Gardner's presentation of the relationships that should exist between this newest agency and the entire health organization and between the various members of the service itself. The vision that is evoked, in the reader's mind, by her highly sensitive views and keen appreciation of relative values and viewpoints, is one that may not fail to inspire the most indifferent to interest and the zealous to rare sacrifice.

To the health official and the nurse, seeking the best in health achievement, as well as to the layman, interested, as so many are today, in the sanitary progress of his community and the socio-economic side of disease, Miss Gardner's book is unhesitatingly recommended.

C. E. Terry, M. D.

The Prevention of Disease. A Popular Treatise. *By Kenelen Winslow, B. A. S., M. D. W. B. Saunders Company. Pp. 337 1916. Cloth, $1.75, net.*

This is another of the now considerable number of books intended for popular consumption that have recently appeared. It is a good one. The author has wisely declined to subtitle it a treatise on personal hygiene or anything of that nature, because the range of subject-matter, while always considered from the standpoint of the non-medical individual, goes far beyond

strictly personal hygiene. This feature is particularly true in the three brief but unusually sound chapters on "germ diseases" and the chapters on the prevention of cancer, and prevention of venereal and mental diseases.

An unusual feature of the book are the all too brief introductory notes to certain chapters, contributed by authorities of world-wide repute; for example, by Bloodgood of Baltimore in the chapter on cancer, and by Goldthwaite of Boston in the chapter on prevention of deformities.

The general style of the book is very clear. The assertions are at times somewhat dogmatic, but in nearly all instances where any such statements are made they rest upon either conclusive scientific evidence, or upon the overwhelming majority opinion of the medical world.

Probably the author would deny any personal literary style. Nevertheless, interspersed through the brief, business-like sentences are allusions with an ironical twist which enliven the general subject-matter and incidentally give a clear picture of the personal views of the author on some hotly disputed points of hygiene. For instance, from the following sentence it is safe to conclude that he is not strongly impressed with vegetarian dietary views: "Herbert Spencer had to rewrite a book first written while he was on a vegetarian diet."

There are a few statements scattered through the book which are liable to challenge, such as "Four per cent. of typhoid convalescents become 'carriers.'" "Water and milk are the chief sources of typhoid."

Certain chapters are particularly worthy of commendatory comment. One of them is the chapter on "Cancer" with the admirable classification preface by Bloodgood. In this chapter are collected in most telling fashion the terrible statistical showing of the disease as a whole, and the statistics of delayed and early operations in striking contrast. Another unusually good chapter with a felicitous title is the one on "Local Troubles as a Source of Serious Disease," under which skillful disguise the adenoid, tonsil, and dental caries lesson is reiterated in simple, clear fashion.

The chapter on "Venereal Disease and Sex Hygiene" presents that difficult subject in an unusually common-sense fashion, happily steering a middle course between the Scylla of emotionalism and the Charybdis of genito-urinary pathology, upon one or the other of which so many well-intentioned sex hygiene reformers have come to grief.

Full of terse practical advice for the middle-aged is the chapter on the prevention of the degenerative diseases of the cardio-vascular-nephritic group.

Another chapter that is particularly valuable for the non-medical reader, and especially for parents, is the chapter on the prevention of deformities, which is illustrated with simple, easily understood diagrams.

Altogether the book deserves almost unqualified commendation, and in nothing perhaps so much as the complete absence of sensational statements. It is a book that the thoughtful teacher or parent can read with ease, in not too long a time, and will find full of sane, interesting information put in the simplest of language, but also giving a clear idea of the very latest advances in matters of hygiene and disease prevention.

Eugene R. Kelley, M. D.

Health Department Reports and Notes.

REPORTS.

East Orange, New Jersey.

In many respects the 1916 Annual Report of the Health Department of the City of East Orange, whose splendid activity in recent years has placed it well up among our most progressive health organizations, is refreshingly novel, and it is evident that the report has been constructed with such forethought that it has risen far from the rut to which so many health department reports cling.

The registration of vital statistics has been

carried to a high degree of refinement and much effort has been expended in securing all out-of-town births and deaths of East Orange residents. If these were not secured it was estimated that an error of 20–25 per cent. would enter in the vital statistical records. This is indeed apparent when one considers that in 1916 23.8 per cent. of the total number of births among East Orange residents were out-of-town births, and 21.7 per cent. of all deaths took place out of town. The 1916 population of this city was 42,279. The birth-rate of 18.2 per 1,000 showed a slight increase, and the death-rate of 11.8 was 1.0 in excess of the three-year average 1913–1915, an increase which can no doubt be attributed to the thorough searching of out-of-town deaths.

Organic heart disease, pneumonia, apoplexy, cancer, Bright's disease and tuberculosis were the six chief causes of death and caused 57.1 per cent. of total deaths; all increasing in 1916 with the exception of cancer. It is interesting to note that the list of all the deaths of the year arranged according to the cause is not incorporated in this report though naturally kept on record in the department's office.

Measles and chickenpox outbreaks in the spring and the well-known infantile paralysis epidemic of the summer are the predominant features among the communicable diseases of the year. Grippe and pneumonia, which unfortunately are not reportable, caused much sickness and many deaths during January, February, and December. The number of tuberculosis cases is slightly above normal, but whooping-cough, scarlet fever, diphtheria, and typhoid fever are far below the averages for the previous years for which records have been kept. An effort has been made to show these facts clearly by diagram.

The anti-tuberculosis work of the Anti-tuberculosis League of the Oranges has been made more effective during the year by the employment of a second nurse. This was made possible by an increased sale of Red Cross seals. During the year 82 new cases were reported, 5 less than in 1915, but 21 more than the average for the previous seven-year period, caused no doubt by the much improved reporting of cases. Eighty-three per cent. were of pulmonary tuberculosis. Thirty-six deaths from this disease are recorded. East Orange did not suffer to the same extent from infantile paralysis as did her neighbors. Fifty-six typical cases were reported, resulting in 10 deaths, giving a death-rate of 2.4 per 10,000 population. The experience of this city leads the department to believe that this dread disease is "absolutely contagious, and that it is spread by the unrecognized cases and, very probably, by adult carriers." Particular stress was laid on the value of the lumbar puncture for diagnostic and treatment purposes, and on the importance of hospital care. Ten deaths and no more than eight cripples were the direct result of this disease in this city.

The clinic at the Orange Memorial Hospital for the treatment of venereal diseases has been continued in coöperation with Health Departments of the other Oranges, and a marked increase in the number of patients shows the growing value of this work.

No increase in the infant mortality was noted, a rate of 62 per 1,000 births, the same as for 1915, being reported. This low rate, however, was not accompanied by a correspondingly low death-rate of children between 1 and 5 years of age. Thirty deaths among this age group were reported, doubling those of the previous year. The Oranges were fortunate last year in having no serious epidemics of milk-borne diseases occurring. The tendency of this group of cities, whose milk is under the supervision of the Joint Milk Committee of the Oranges, is to eventually allow only that raw milk into the city which is certified.

As with all cities, many of the complaints of nuisances which are received by the health department have no relation to health whatsoever, and it is hoped that such conditions will improve, so that more advantageous work can be done in other lines. Plumbing, it is hoped, can soon be transferred to the building department, though efforts along this line during 1916 met with opposition. The recommendation of the health department of last year for the equipment of a laboratory was adopted, and its installation has proven a good investment.

Among the several recommendations contained in this excellent report is one calling for a Public Health Bulletin for the city. It is felt that "the great work of the modern Board of Health is education, and the issuing of popular reading matter is realized to be the best way of accomplishing the result."

The report is concluded by the financial state-

ment which shows the per capita health expenditure of this city to be 21 cents per year, comparing most unfavorably with the surrounding cities. Only 79 per cent. of the annual appropriation of East Orange is directed toward the improvement of its health. Yet so wisely has this small amount of money been expended and so well has the health administration been regulated, that the activities of the department under the able direction of Health Officer John Hall have assumed a most commendable high standard of worth.

Columbia, South Carolina.

One of the earliest 1916 reports received is the Annual Report of the Health Department of Columbia. This city reports a resident death-rate of 14.97 per 1,000 population. Of the 519 deaths occurring among the 34,611 inhabitants, 217 were white and 302 negroes. The non-resident deaths are not reckoned in this rate because it is felt that such is unjustified because of the location in this city of the State Hospital for the Insane which contributed 348 of the 454 non-resident deaths. The white death-rate, based on a population of 19,878, is 10.91; the colored death-rate, among 14,733 negroes, is 20.50. The combined death-rate is the lowest ever reported in the city; the 1915 rate being 19.65, and the lowest rate heretofore, 15.63 in 1911. Of the 134 fewer deaths in 1916 than during the previous year, 108 represented a decrease in deaths of negroes—a reduction of 27 per cent. This is accounted for by the intensive campaign made by the sanitary inspectors in the negro quarters. Deaths from typhoid, pellagra, tuberculosis, organic heart disease, and cancer deceased during 1916, particularly in the case of tuberculosis and pellagra, though the reporting of tuberculosis is by no means complete.

It is recognized that the infant mortality is too high. During 1916, 16.76 per cent. of the total deaths were of infants under one year, while 26.96 per cent. were of children under five. Every effort is being made during 1917 to reduce these percentages.

Though typhoid cases dropped from 120 with 17 deaths for 1915 to 67 cases with 12 deaths in 1916, no let-up in the campaign on the unscreened surface closet and the ever-present fly will take place, and it is hoped as a result that the too high incidence of this disease will be diminished. Diphtheria gave the lowest morbidity rate in the city's history, 31 cases being reported. This is no doubt due to the practice of culturing diphtheria contacts, a procedure instituted in October, 1915.

The sanitary engineering division of this department has been exceedingly active and much of the improvement in the sanitary conditions in this city as evidenced by this report can be attributed directly to its efforts.

Evanston, Illinois.

The tendency of making health department reports mean something to the average citizen is increasingly obvious as the 1916 Annual Reports come to hand. The point is well illustrated by the 1916 Annual Report of the city of Evanston, Ill., which compares with its own records the records of other cities of its size in the country, in this case Orange, N. J. and Colorado Springs, Col., also with its large neighbor, Chicago. Evanston reports a death-rate of 9.18 per 1,000 for its population of 34,000 (non-resident deaths excluded). Pneumonia was the chief cause of death, causing 32 deaths. Deaths from tuberculosis were reduced from 21 in 1915 to 14 for the reported year. Birth reports are considered accurate. In this connection, for every birth report and death report sent into the state capitol, a fee of 25 cents is allowed, which this year will increase this city's health fund by $280.

Through the efficient sterilization of the city water and an efficient milk supply supervision not a single case of typhoid fever was reported. Since 1911 the decline in the number of cases of this disease has been constantly sustained. The incidence of contagious diseases compares favorably with the previous year with the exception of scarlet fever, which became quite prevalent during the spring and fall of the year. It is curious to note, however, in this connection

that the first cases reported were not among school children but among adults travelling back and forth to Chicago.

The public health laboratory of this city has been most energetic. One interesting table, after taking all considerations into account, shows conclusively the excellent improvement in the milk supply of this city for the last five years. The percentage of analyses having the lower bacterial counts have steadily increased, while the per cent. running in the higher counts have steadily decreased. In 1916 of 127 samples of pasteurized milk, 77 per cent. showed counts under 100,000.

Though the laws of the state do not make vaccination a prerequisite for admission to school, the occurrence of a case of smallpox in one of the public school teachers is hoped to afford a powerful weapon for the pleading of such an ordinance to be passed.

It is to be regretted that this otherwise excellent report does not seem to attribute sufficient importance to infant mortality. In fact scarcely any reference can be observed to this phase of the health department's work. Medical inspection of school children, and the careful control of contagious diseases, notwithstanding the existing unsatisfactory quarantine regulations, as well as school hygiene have been carried to a high degree of efficacy. The reports of the other divisions, particularly that of Food and Dairy Inspection and Sanitary Inspection indicated that they have effectively coöperated to make the year 1916 a most favorable year for this city's health.

NOTES.

Milk-Borne Typhoid Fever.—There is published in the January *Monthly Bulletin* of the New York City Department of Health an instructive article by Dr. G. F. Nicholas, Chief of the Division of Epidemiology, on the application of a new epidemiological procedure in detecting the source of infection applicable to such outbreaks as are due to milk-borne infection.

Early in the present year this division undertook the study of typhoid fever as reported from the various rural sections where shipping stations sending milk and cream to New York City were located—the so-called "milk shed" of this city. The plan involves the tabulation by states and counties of all such localities, and entering against each locality its typhoid fever record for a number of years back, also whatever other details available. By this means attention is called to localities having a bad typhoid record, a condition which would indicate constant sources of infection, which leads in turn to a special scrutiny of any milk stations located in such a territory.

Doctor Nicholas describes the twofold value of this new procedure. First, it primarily is designed to help control typhoid infections in that city. Secondly, it exerts an educational effect also on the rural community involved since it makes them realize that it costs something in more ways than one to go on having typhoid fever year after year.

The following example of the working of this new procedure is cited:

"Thus, a certain village with a population of only some two hundred and seventy-five, shows a record of one, two or three cases of typhoid fever year after year for the past eight or ten years. This locality supports a milk pasteurizing plant shipping from eighty to one hundred cans of milk daily to New York City. This milk is retailed as 'loose' or dipped milk. In that part of the city where it is sold there is a sharp rise in the number of cases of typhoid fever. Within a very few days the reports of investigators show two or three instances in which the milk in question was used. Taken together with our knowledge of conditions at the source of this particular milk supply, this justifies the exclusion of the milk forthwith. The supply is accordingly excluded, whereupon the city outbreak comes promptly to an end. Investigation at the pasteurizing plant discloses abundant chances for contamination, both in the way of possible 'carriers' among the employees, and in a water supply with a high colon bacillus count. As additional cases in the city outbreak come to light, it is found that more and more of them had used this milk."

The two points strongly emphasized are: the value of the procedure as a means of recognizing the source of milk-borne outbreaks of typhoid fever; and that the procedure will cause the

source of contamination to be disclosed at an earlier date. That this procedure is not applicable to localities shipping milk which is effectively pasteurized at some central pasteurizing plant in the city is obvious.

✱

"The Fate of Venereal Notification in England.—It is easy enough for enthusiastic reformers to advocate legislation to do away with their pet evils. It is harder to get such legislation passed; even if this difficulty be surmounted it may be impracticable to enforce the law, and even when this has been done it is sometimes found that the situation is not at all ameliorated. Thus it is with the societies for the suppression of vice, and kindred bodies who would prohibit prostitution, make the notification of venereal diseases compulsory, punish all sexual delinquents, and by divers other legal aids place the feet of the populace in the strait and narrow way and see that they march therein.

"In England there has lately been an agitation to make the notification of venereal diseases compulsory and the British Medical Association appointed a committee consisting of the chairmen of all standing committees to consider what should be the attitude of that body in the matter. It is significant that this committee, after careful consideration of the subject, arrived unanimously at the conclusion that such a system would be unfortunate. The main two objections found by the committee were that such a law would lead to concealment of venereal diseases, and that, even if notification were made, this would not help any in the treatment of such disorders.

"The British Medical Association is of the opinion that there are two indispensable preliminary steps to such a law. First, facilities should be provided by the community so that the suffering individuals may be assured of proper treatment, regardless of their financial condition. Second, that charlatans should be put out of business by directing heavy penalties against the advertising of quack nostrums and the attempt to treat venereal diseases by unqualified or incompetent persons.

"These delays may seem intolerable to the headlong fanatic who would legislate all these diseases out of existence, but the thoughtful medical man will agree that some such approach to the problem presents more promise of success than mere punitive measures."—*New York Medical Record*, February 10.

✱

Chicago Prepares.—The first steps in the campaign of prevention against a possible threatened outbreak of infantile paralysis in Chicago and the nearby cities during the coming summer was recently taken. The meeting was called in accordance with a request issued by Mayor Thompson, and is described by the February 17 *Weekly Bulletin* of the Chicago Department of Health. The meeting was presided over by Health Commissioner Robertson, and was attended by representatives from the various civic and medical organizations of Chicago and environs. It is interesting to note that the Police Department was represented by the Chief of Police and all of his police captains. The Superintendent of Streets together with the ward superintendents and nearly 100 physicians and social workers were in attendance. As a result of the meeting an association for the prevention of infantile paralysis was organized with fourteen working departments. Funds will be contributed by the various municipalities interested, and if found necessary, private subscriptions will be solicited. Among the principal activities outlined at this meeting are preparations for a vigorous campaign along sanitary lines against dusty streets, dry cleaning, filth covered vacant lots, insanitary milk depots and food establishments of all kinds. It is stated that an element of hope was introduced into the meeting by Dr. Maxmilian Herzog, Chairman of the Committee on Research at the Cook County Hospital, who informed the meeting that by next summer he hoped to have an effective serum against this disease. He hopes to be able to develop a serum from an antitoxin that had been found in a measure effective in sheep and horses. Dr. C. T. Roome, Health Officer of Evanston, Ill., urged the importance of careful diagnosis. Dr. W. A. Evans brought out the additional point of the standardization of symptoms to help in such diagnostic work, in order that prompt removal and hospitalization of suspicious cases might be enforced. Dr. John Dill Robertson was elected chairman of this organization and the many other officers both of the organization and of its many committees give proof of a general municipal representation.

A Still Lower Typhoid Rate.—In 1915 the California State Board of Health declared its intention to reduce the typhoid fever death-rate from 13.6 per 100,000 population (the rate for the year 1914) to 9.6 per 100,000 population in 1918. As a matter of fact, however, this declaration was nearly fulfilled in the year 1915, when the rate was reduced to 9.7 per 100,000 population. And now, the typhoid death-rate for 1916 is 7.1 per 100,000 population, lower than the board hoped it would be in 1918. If the measures employed in typhoid fever control are continued and if the same coöperation of the people of California is received, the board hopes to reduce the typhoid death-rate to a point below 5.0 per 100,000 population in 1918.

This may be accomplished through the prevention of the sewage pollution of public and private water supplies; the insurance of safe milk supplies through the pasteurization and inspection provisions of the state milk law; investigation of outbreaks of typhoid fever, determining and removing their sources; manufacture and distribution to physicians of typhoid vaccine; inspection of hotels, eating places, summer resorts and surroundings, correcting insanitary conditions that may be present; enforcement of laws and of the board's regulations for the prevention of typhoid fever; and by education in the prevention of typhoid fever.

If the high rate of 1906, 32.2 per 100,000 population, had prevailed in 1916, there would have been 950 deaths from this disease. There were but 208 typhoid deaths in 1916, however.

In order to secure these results, it is necessary that the California State Board of Health shall have the active support of health officers, physicians and citizens. All of the common rules of sanitation, particularly as related to sewage disposal, water and milk supplies, must be rigidly observed. The regulations of the board for the prevention of typhoid fever should be carefully followed by physicians and health officers. With such coöperation, California may soon have one of the lowest, if not the very lowest typhoid death-rate of any state.

*

City Schools to Teach Health.—The City of Kenosha, Wis., is to take the lead of all cities of her class in the nation, in announcing recently that the health department of the city and the department of public schools will coöperate in the establishment in the schools in Kenosha of courses in sanitary instruction and hygiene which are to be open to any citizen in the city. The course will not only be open to any citizen in the city, but the superintendent of education and the commissioner of health have decided to give the children such portions of the proposed work as will be comprehended by them. The idea is to assist them in understanding better the reasons for protecting their own health and the need of coöperation in handling all questions of health and sanitation. Not only is it thought that this new project will be of great value to the children but also to all citizens. It is believed that the following subjects may be profitably taught the children: Contagious diseases, the rôle of the laboratory in health promotion, ventilation, garbage, sewage, water disinfection, and fumigation. The synopsis of the course as worked out by the two departments is as follows:

1. Contagious diseases. 2. School inspection. 3. Physical examination of school children. 4. Infant welfare field work. 5. Summer baby camp. 6. Laboratory (microscopical, chemical, bacteriological). 7. Inspections (meat, milk, food, sanitary). 8. Office administration. 9. Vital statistics. 10. Research. 11. Ventilation. 12. Garbage. 13. Sewage. 14. Water. 15. Disinfection and fumigation. 16. Publicity and education. 17. Funeral inspection. 18. Social welfare. 19. General preventive medicine. 20. Health ordinances.

In writing relative to this project, Health Officer H. L. Wright of this city states that "while we realize the fact that it is quite an undertaking, yet we expect to accomplish results and lay something of a foundation for the future."

*

Health Protection in the Sunday School.—The enforcement of the law applicable in the public schools to the effect that a pupil absent for a certain number of days, before being admitted to the classroom must present a medical certificate stating that his absence during this time was not caused by a disease of communicable nature, has been of material aid in keeping down the number of cases of communicable diseases in the public schools of Chicago, and too, of other cities no doubt. The same rule should apply to other classes of schools says the February 3rd *Bulletin* of the Chicago Depart-

ment of Health. It must indeed be pleasing to this department to be able to announce that at a recent meeting of the ministers of Chicago the following resolution was passed by unanimous vote: "Resolved, that the superintendent of each Sunday School, or a committee which may be appointed for that purpose, investigate carefully the cases of pupils absent in case of sickness, either themselves or members of their family, ascertain the cause thereof, and prevent a too hasty return to the Sunday School."

"There can be no doubt" states this bulletin, "but that this is a step in the right direction, and it is hoped that the clergy and Sunday School superintendents throughout the city will fall in line and do what they can to see that the rule is enforced. It is a measure along the lines of conserving public health and one that should have the active coöperation of every good citizen."

✦

Connecticut Proposes Reorganization.—"The infantile paralysis outbreak of last summer and the widespread smallpox epidemic with which we are now threatened, have emphasized the urgent need of more adequate organization for the protection of the health of our citizens. . . . What is needed is the reorganization of our state health machinery so that the State Board of Health may be strengthened and placed in a position to furnish to the local health officer the advice and moral support which he needs. I urge earnest consideration of this question, with a view to a remodeling of our state health laws, and that you make an appropriation for the State Board of Health sufficient to 'give our state a health administration adequate for modern needs," were part of the encouraging remarks relating to the health of the state made by Governor Holcomb in his inaugural message as printed by the January *Monthly Bulletin* of the Connecticut State Board of Health. This *Bulletin* further reproduces a diagram of the proposed organization of the State Department which well coincides with the most advanced ideas of public health administration.

The suggested legislation needed to accomplish this plan will authorize the State Board of Health: (a) To adopt and to secure the enforcement of uniform sanitary regulations throughout the state, (b) to divide the state into four sanitary districts and to appoint deputy state health officers as supervisors, (c) to appoint and define the duties of directors for the bureaus of sanitation and sanitary engineering and preventable diseases, (d) to appoint certain local health officers and to define the duties and relationships of all appointees and health officers, (e) also, legislation permitting the consolidation of towns or towns and cities for the purpose of securing the services of a full-time health officer with the privilege of selection, (f) to carry out the provisions above cited, the appropriation of the State Board of Health must be increased about $30,000, an increase of 2½ cents per capita.

The following brief effective advice is given by the *Bulletin* to its many readers: "Deprive yourself of one trolley ride or one cheap cigar and the nickel saved will pay your share of the cost of state health work for a whole year."

✦

Whooping-cough.—The January *Quarterly Bulletin* of the New Hampshire State Board of Health strikingly substantiates the claim that three times as many persons die from whooping-cough as from scarlet fever, and twice as many as from measles, by publishing the death returns from these three diseases of childhood during the past eleven years.

Such a record is as follows: 355 deaths from whooping-cough; 184 deaths from measles; and 122 deaths from scarlet fever.

Barring fractions, this gives an average annual mortality of: 32 deaths from whooping-cough; 16 deaths from measles; 11 deaths from scarlet fever.

Of the 355 deaths from whooping-cough: 255 were under 1 year of age; 93 between 1 and 5; 5 between 5 and 10; 2 above 10 years of age.

The general public, states this *Bulletin*, is apparently oblivious to the fact that whooping-cough is a most dangerous communicable disease, and it further deplores the "reprehensive neglect" on the part of the public in connection with this disease.

✦

Swimming Pools Should be kept Sanitary.—Public swimming pools should be kept in the most sanitary condition, in order that they may not be sources of disease infection. The Cali-

fornia State Board of Health is interested in the relation of such places to the spread of communicable disease, and desires that all public swimming pools and bath houses be placed under the board's supervision. Not only should the water in these pools be of unquestioned purity, but the bathing apparel and towels should be cleaned, dried and stored in a sanitary manner. Life saving apparatus should be provided and measures to insure the safety of bathers should be adopted. The personal cleanliness of bathers should also be required.

During the past summer, several cases of communicable disease, undoubtedly contracted in public swimming pools, came to the attention of the board. The need of the sanitation of such places is apparent and it is proposed that all public swimming pools be required to operate under a permit from the board. A bill, in which adequate provision for the safety of the bathing public is made, is now before the legislature. Under the proposed measure, every necessary precaution for conserving the health of bathers is taken and if the bill becomes law it is reasonable to believe that all who enjoy swimming or bathing in public pools may enjoy the sport in safety.

⁂

Horse Flesh for Food.—Following the provisions of the New York City Sanitary Code legalizing the sale of horse meat under a permit granted by the Board of Health and subject to the board's regulations, the first market for the sale of horse meat in that city was opened during the last of January. In order to prevent deception, no other meat can be sold in such establishments, and every precaution is taken to safeguard the consumer, the horses being slaughtered under the supervision of the veterinarians of the health department. In this connection there is reproduced in the *Weekly Bulletin* of the New York City Department of Health for February 17, a letter addressed to the Department of Health by Dr. W. Horace Hoskins, Dean of the New York State Veterinary College, commending this new venture. The letter is as follows:

"I am much interested and quite approve of the action of your department in permitting the opening of establishments for the sale of horse meat.

"So clean an animal, so free from tuberculosis and many other serious lesions common to our flesh-producing animals, and the continually soaring high prices of animal foods, makes it extremely desirable that opportunities be afforded to obtain cheaper meats.

"The long prejudice held by so many people against horse meat, I trust, will soon be eliminated."

⁂

Blood Analyses in a State Health Laboratory.—In the current *Quarterly Bulletin* of the State Board of Health of Rhode Island there appears the following excellent editorial in support of increasing the scope of the State Health laboratories so that it will include this important field of analytical work:

"Although the present scope of our laboratories is comprehensive, there is still fresh opportunity for the application of newer methods in chemistry. Since recent literature indicates the value of uric acid, the nonprotein nitrogen, and the urea nitrogen content of the blood as indices of renal function, a system of practical tests should be adopted in order to estimate uric acid, creatin, sugar and the CO_2 combining power of the blood. These blood determinations give more accurate diagnostic and prognostic information than is afforded by urinalysis and their advantage lies in the fact that the physician does not have to pay attention to prepared diets and to specimens of urine carefully collected. Also, the relation of these facts to renal disease assumes importance in consequence of the mortality of the age groups beyond 25 and 30 years. It is an alarming fact that the death-rate for Bright's disease has increased from 95.2 to 103.1 per 100,000 in the interval between 1909 and 1912 in the registration area. It seems a duty and an obligation of the State Board of Health to pursue remedial investigations in this field also, and it feels justified in using the laboratories for this purpose.

⁂

National Board of Medical Examiners.—The second examination to be given by the National Board of Medical Examiners will be held in Washington, D. C., June 13, 1917. The examination will last about one week.

The following states will recognize the certificate of the National Board: Colorado, Delaware, Idaho, Iowa, Kentucky, Maryland, North Carolina, New Hampshire, North Dakota and Pennsylvania. Favorable legislation is now pending in twelve of the remaining states.

A successful applicant may enter the Reserve Corps of either the army or navy without further professional examination, if their examination papers are satisfactory to a Board of Examiners of these services.

The certificate of the National Board will be accepted as qualification for admittance into the Graduate School of the University of Minnesota, including the Mayo Foundation.

Application blanks and further information may be obtained from the Secretary, Dr. J. S. Rodman, 2106 Walnut Street, Philadelphia.

Public Health Notes.

Commission on Milk Standards.—*Public Health Reports*, for February 16, publishes the Third Report of the Commission on Milk Standards appointed by the New York Milk Committee.

The preamble sets forth the essentials of proper milk standards for efficient milk control by public health authorities; shows the advantages of such standards to the milk producer, the milk dealer and the milk consumer, and emphasizes the necessity of satisfactory administrative equipment for properly guarding and enforcing them. It also advises the grading of milk.

A special committee, composed of chemists, advise that the chemical standards be 3.25 per cent. fat and 8.5 per cent. solids—not fat, for cow's milk. Sellers of milk are to be permitted to sell under these standards, or under a guaranteed statement of composition.

Bacteria and bacterial testing received more of the commission's time than any other subject. The standard methods of the American Public Health Association Laboratory Section have been adopted for making the bacterial count. It is recommended that, "at least five consecutive bacterial counts, taken over a period of not less than one week, nor more than one month, and that at least four out of five of these counts (80 per cent.) must fall below the limit or standard set for the grade," be made for the purpose of grading and for prosecutions. Various reasons showing the relationship of large numbers of bacteria to infant mortality are enumerated.

The commission defines pasteurization as follows: "That pasteurization of milk should be between the limits of 140° F. and 155° F. At 140° F. the minimum exposure should be 20 minutes. For every degree above 140° F. the time may be reduced by one minute. In no case should the exposure be for less than five minutes."

They recommend that all milk, excepting grade A raw milk, be pasteurized, preferably in the final container. A holding time of 30 minutes at a minimum temperature of 145° F. is advised in order to allow a margin of safety under commercial conditions.

As a guide to health officers in the establishment of grades of milk best adapted to their local communities, the following fundamental principles are offered:

"(*a*) Grade A milk, in a general way, is milk which complies with requirements of such character and degree that, for all practical purposes, no real advantage would be gained by further and higher requirements. The standards for this grade should therefore be placed high enough to attain this end, but not so high as to limit too greatly the supply, or, through unduly raising the price to the consumer, to limit too greatly the demand.

"(*b*) Grade B milk is all the remaining milk of the community which is suitable for drinking purposes, after pasteurization, but which does not comply with the high requirements for grade A milk.

"(*c*) Grade C milk is milk which falls below the minimum requirements for milk suitable for drinking purposes, even after pasteurization. Its use must be confined to cooking and manufacturing purposes. Recognition of this grade of milk is not recommended by this commission except in communities in which such recognition is an economic necessity.

"The fundamental objects in grading milk are:

"(*a*) To aid in making safe for human consumption all milk which can legally be sold for drinking purposes;

"(*b*) To distinguish between classes of milk which, while all are safe, are of different degrees of excellence in respect to cleanliness and care in handling."

The report states: "In the interest of public health, cream used in the manufacture of butter should be pasteurized before being used"; and also: "that all milk and cream used in the manufacture of ice cream be pasteurized."

It is urged that laws prohibiting the sale of skim milk as a food, be repealed.

Clarification is not recommended as a required standard method.

Two appendices are included in the report. The first deals with the factors of primary importance in dairy practice for controlling the sanitary character of milk; and gives a recommended form of score card for ice cream manufacturing plants. The second appendix relates to the history of the Commission on Milk Standards appointed by the New York Milk Committee.

Hygiene of the Head Cavities.—"There is no more important field of preventive medicine than that of the hygiene of the head. The more one studies the modern man—civilized, cultured, pampered, served by scientifically harnessed natural forces almost as was Aladdin by the slaves of the lamp—the more evident it becomes that disease, old age and death fairly radiate from the cavities of the head."

So says Eugene Lyman Fisk, Director of Hygiene, Life Extension Institute, New York City, in an article entitled, "The Rôle of Mouth Infections and Mouth Abnormalities in the Causation of Disease."

"Season after season the mass of the population suffer from naso-pharyngeal affections involving acute bacterial attack and resultant strain of organic tissue."

In addition to the effects of these affections, Doctor Fisk further states: "We have to consider the effects of the establishment in the various head cavities of chronic foci of infection."

He believes: "That if the cavities in the head could be kept in a thoroughly healthy state, free from infection and their functions well maintained, at least four years could be added to the expectation of human life."

The head cavities are considered to be, "the region par excellence for the entry of infection, as well as for nutritive material and oxygen."

Excluding the brain, very few individuals enjoy absolutely normal and perfectly functionating head cavities.

Concerning orthodontics he says: "These tooth irregularities contribute very largely to mouth infection and hence to organic disease. It seems true that the modern mouth is degenerate in all its parts."

In conclusion: "The detection of these abnormalities . . . should be a systematic routine affair, applied to the whole population."

It is then urged that facilities be provided by which the benefits of this treatment may be extended to all who need it.

The article appears in the *Texas Medical Journal*, for January, 1917.

Infantile Scurvy.—A. F. Hess, New York (*Journal A. M. A.*, Jan. 27, 1917), defends his opinion, formerly expressed, that infantile scurvy may be caused by the continual use of pasteurized milk. This is contrary to the opinion expressed by the National Commission on Milk Standards but he considers that it is still correct and offers additional facts. The practical deduction, however, from his observation is not that pasteurization should be discouraged but merely that the important fact should be recognized that milk treated in this way is not a complete food for infants, but that it is imperative to give an antiscorbutic substance in addition. When this prophylactic measure is adopted, pasteurized milk is to be recommended as a most valuable food for infants. When it is neglected, however, he thinks that scurvy brought on in this way is not at all infrequent. He points out the differences of scurvy produced by pasteurized milk from those of the florid disease. "The affected baby is usually in the second half of the first year of life, and does not gain, or gains but slightly for weeks. It may be fairly well nourished, but is pale, with perhaps slight edema of the eyelids. The mother or nurse complains that the child is irritable and peevish, and that the appetite has diminished. The gums may show merely a

lividity or slight peridental hemorrhage, which on subsequent examination is no longer visible, and may have consisted merely of a rim of crimson edging the borders of the upper gum, or perhaps have been situated behind the upper incisor, as Still pointed out. On closer examination it may be observed that the papillae of the tip of the tongue are markedly congested, and that a petechial spot is to be seen on its frenum, on the palpebral conjunctiva, or here and there on the surface of the body, more especially where there are erosions, eczema or other skin lesions. Attention may be called to tenderness of the lower thighs, which in some instances is definite, in others so ill defined and fleeting that it is impossible to feel convinced of its significance or even reality. There may be a slight edema over the crests of the tibia, of the kind which does not pit on pressure. The knee jerks are almost always markedly exaggerated. The urine is found to be normal or to contain some albumin and red and white blood cells." These symptoms are subject to manifold variations and there are others worthy of note, especially the changes in the skeleton shown by the Roentgen ray, and those of the heart. Hess specially calls attention to the cardiorespiratory phenomena, in which the respiration goes as high as 60, and the pulse beats to 140 or 150. There is a sharp drop in the pulse and respiration after giving orange juice, which is evidence of its scorbutic nature. An increase in respiration is a polypnea rather than a dyspnea, and the slight disturbance it seems to make in the child has probably caused its being overlooked. There is one more link in the evidence that the nervous system is involved which has been shown by his former observation of changes in the eye-ground and the reflexes. The disease occurs generally in infants from six to nine months of age who have been fed for considerable time on heated milk. Another type found occasioned by pasteurized milk is the latent form of scurvy, a state of malnutrition which develops slowly as a result of a negative balance of "vitamins." It is rarely definitely diagnosed except by the relief of symptoms by antiscorbutics.

✦

Public Health and Private Conscience.—We wish to call the attention of our readers to a little booklet under the above title which was recently received. This booklet was prepared by the Instructive District Nursing Association of Boston, Mass., and has been written with the idea of bringing the work of this association before the public in a more popular way than annual reports can hope to do. In it are briefly though interestingly discussed the importance of health and the expense of ill health, and an historical sketch of the development of the public health nursing movement in Boston from 1885 to the present day. In general the association of today has set itself four main tasks: "To provide competent bedside nursing for those unable to pay for it; to provide such service at cost for people of limited means; to inculcate the elementary principles of hygiene and sanitation which make for a better and healthier community, to educate the public to an appreciation of the fact that public health is, or should be, a public responsibility." The booklet goes further on to state the manifold duties of the public health nurse and the several excellent illustrations it contains well emphasize the importance and nature of their work. As is the case with most of the welfare organizations, this Association has recognized its main function as that of clearing the trail for more organized, better financed, work to follow, and one of its chief services has been to demonstrate the need of public health work, later to be taken over by the municipal and state authorities.

✦

The Rat.—Some time ago we had occasion to comment in the pages of the JOURNAL upon the activities of the Women's Municipal League of Boston in combating the rat menace in that city. Recently this same league has issued a most excellent bulletin entitled "The Rat" which sets forth arguments for its elimination and methods for its destruction. This bulletin, or better monograph, was written by Assistant Surgeon General R. H. Creel, of the United States Public Health Service, especially for use by this League in its present rat campaign. Doctor Creel first dispels the widespread belief that an animal parasite, no matter how obnoxious, has compensating features. After conservatively estimating the rodent population of the United States as one rat per person, the author describes the species, the habits, and the destructiveness of the American rats. In discussing rats as

disease transmitters the statement is made that of all disease-bearing parasites the rat stands supreme in the cost its presence has entailed upon mankind in toll of lives and money. In view of this statement it can scarcely be wondered at that the women of this city are effectively waging their campaign against this parasite. The monograph ends with considerable discussion of the methods of destruction of the rat and prevention from this menace. Concerning the prevention it seems that rat proofing is the only means by which it is possible to materially reduce the rodent population.

This bulletin is a splendid example of the benefits which can be derived from the union of women to control or to improve the general sanitation of a community. The power of an organization of women can be, indeed, enormous and it is to be hoped that the consideration and benefits derived from the publication of this bulletin will be deserving of the efforts which prompted its preparation.

✤

Where Memory Is Golden.—The earnest labors of a certain class of workers engaged in the business of "skinning the public" have been liberally and forcefully recognized by the medical press, and more recently by a considerable number of state and local health publications. None, however, compel our admiration to a greater extent than the gifted editor of the Ohio *Public Health Journal*.

It seems that the following letter from a seven-year old appeared in an advertisement published in the *Ohio State Journal:*

"I took the whooping-cough when I was only two months old. It settled on my lungs and I gradually declined until it was necessary to carry me on a pillow. They took me to the doctor and tried every one they thought would help me, but got little relief from my cough. After taking a bottle of your medicine, I found that I was improving very much. I have taken Nacor until my cough is almost gone. I am now seven years old, weigh 46 pounds and go to school every day. I give Nacor all the praise for my relief and hope that I can only cause some one else to try it."

Our editor is moved by the inexcusable negligence of the Nacor people in not calling their wonderful discovery to the attention of educators, correspondence schools of memory training, or even to physicians with difficult cases of amnesia. "Such a wonderful specific as this may even lead to the re-casting of one of our old favorite songs," he exclaims, and grasping his lyre, sings us the following:

"How dear to my heart are the scenes of my childhood
When a stiff drink of Nacor transports me with joy,
E'en back to the point of my very beginning,
As I hear the Doc saying: 'Fine work! it's a boy.'
The excitement, the yelling, the relatives telling
The good neighbor women who rush in to see.
Oh give me the bottle, the only draught what'll
Bring all them dear scenes again clearly to me.

"So up from my earliest days I remember,
Thanks to the sweet potion which rolls back the years,
My colic and whooping-cough, measles, distemper,
My joys and my sorrows, my smiles and my tears.
But I keep regretting and cannot help fretting
And constantly stop reminiscing to mourn
That at two months no faker had dosed me with Nacor
So my mem'ry'd go back to *before* I was born."

✤

The Cigarette and the Heart of the Soldier.—It was a foregone conclusion that the conditions of the present war would bring into prominence various forms of heart affections. Of course, organic disease would disqualify a man from serving in the army, but there can be little doubt that in the circumstances of this war and especially during the later phases many with heart defects of a more or less serious character have been passed in, who in the ordinary course of events would have been at once rejected. However, it is not so much with the cases of organic disease that the discussions which have been taking place among the medical men of the warring European nations have been concerned, but rather with those cases which apparently have

been developed by the stress of warfare. Sir James Mackenzie and several British physicians debated in the pages of the prominent English medical journals, the condition known as the irritable heart of soldiers and came to no definite conclusions. Undoubtedly, however, the nervous strain under which soldiers live had much to do with the development of the irritable heart as well as of other forms of heart affection. It was by some suggested that cigarette smoking, which habit is prevalent among a very large proportion of soldiers, might be a factor in the production of the irritable heart.

Dr. E. Kilbourne Tullidge writing in the *Military Surgeon*, January, 1917, on the heart of the recruit and soldier, basing his remarks on his experience in the Austrian army, points out that in most of the cases of irritable heart, the symptoms developed suddenly, following some physical strain or stress of the campaign. In a number, chiefly younger men, the disturbance could be traced directly to the excessive use of tobacco, resulting in increased blood pressure and concomitant signs of a developing insufficiency. This, Tullidge thinks, is a strong indication, and an important one, that tobacco, notably cigarettes, should be restricted among the troops on active service. He believes that its use fulfills a much needed and sought after solace, but there is no question that it is carried to excess, with results that must necessarily weaken and lower the physical and systemic resistance of the men. Tullidge states that excessive smoking was universal among the soldiers with whom he came into contact and that as a result not only were nervous phenomena of the heart observed, but catarrhal conditions of the mouth, throat, and pharynx occurred, with gastrointestinal symptoms of every description. In the main he seems to agree with Mackenzie as to the non-pathological significance of the irritable heart of soldiers, but the point in his paper to which attention is especially drawn is that tobacco smoking, especially cigarette smoking, is largely responsible for these nervous cardiovascular disturbances.—*Medical Record*, February 10.

✠

Fifteen Thousand Mothers Die in the United States.—More women 15 to 45 years of age die in the United States from conditions incident to maternity than from any other cause except tuberculosis. And since 1900, while the death-rates from tuberculosis, typhoid, diphtheria and croup, and certain other preventable diseases have been greatly reduced, the available figures for the death registration area show no decrease in the proportion of mothers whose lives are sacrificed yearly to ignorance and improper care in childbirth.

These facts and their causes, with a detailed study of maternal death-rates in the United States and foreign countries, are set forth in a bulletin on Maternal Mortality by Dr. Grace L. Meigs, which has just been issued by the Children's Bureau of the United States Department of Labor.

Doctor Meigs emphasizes the inseparable connection between the life and health of the mother and the life and health of her baby. She points out that the 15,000 maternal deaths which occur annually in the United States are largely preventable; that these 15,000 deaths are merely a rough index of unmeasured preventable illness among mothers; and that the protection of mothers is essential to the saving of babies' lives.

How can the protection of mothers be accomplished?

Two underlying causes are assigned for the present conditions:

First. The hazards have been either ignored or accepted as unavoidable. "Knowledge of the need for good care at childbirth is essential; the lack of such knowledge and of a demand for this care has been, probably, the chief factor in producing the present indifference to this phase of preventive medicine. Communities are still to a great extent indifferent to or ignorant of the number of lives of women lost yearly from childbirth."

"The second fundamental cause—the difficulty of obtaining adequate care—is seen to depend to a large extent on the first. As women, their husbands, physicians, and communities realize the absolute need of skilled care, methods for providing it will be developed."

The city problem and the rural problem are both discussed.

Even in a city well supplied with clinics and hospitals the number of women served by them is small in comparison with the number who bear their children without receiving adequate

care. Certain sections of the population depend on ignorant midwives. But the reader is reminded that women of moderate means who can not pay large fees and who will not visit a clinic sometimes receive the least benefit from improvements in standards of care.

"In rural districts many women bear their children with no attendant other than the husband, a relative, or a neighbor. The nearest physician may be miles away, the nearest hospital much farther."

Doctor Meigs refers to the work for maternal and child welfare which has been developed in New Zealand and in Canada, and suggests a "unit plan" for a rural county in this country to include:

A rural nursing service, centering at the county seat, with nurses especially trained to recognize dangerous symptoms in prospective mothers.

An accessible county center to which mothers could come for information about personal hygiene.

A cottage hospital, or beds in an accessible general hospital, especially for the proper care of abnormal cases.

Skilled attendance obtainable by each mother in the county.

✻

Hospitals for Small Towns.—*The Modern Hospital* for January, 1917, contains an editorial on the use of old buildings for hospital purposes.

It states that the time is coming when hospital facilities will be required for practically every case of sickness.

At present approximately 12 per cent. of the illness in this country coming under the physician's care is hospitalized and about 88 per cent. is cared for in the homes. This means that the number of hospital beds must grow amazingly to keep step with the education of the public to demand hospital care.

Approximately $300,000,000 is being expended annually in the United States for hospital buildings and almost an equal sum for the maintenance of hospitals.

Large, wealthy communities can take care of themselves but in rural districts and small towns hospital service must be afforded at a minimum cost. In many of these communities large, well built residences can be found with such interior arrangements that they could be transformed for hospital use for an extremely modest sum.

Fire protection is an important factor in considering such a building for hospital use, but with our modern methods we can go far toward eliminating fire risks in a one- or two-story dwelling house.

The article concludes by saying that one such hospital in a town is worth more to that community, if properly administered, than dozens of finer hospitals that must be reached by railroad travel of fifty or a hundred miles.

✻

Community Control of Tuberculosis.—Dr. Haven Emerson, commissioner of health of New York City, writing in the *Journal of the Outdoor Life* of January, 1917, says: "The community control of tuberculosis narrows down to the discovery of the carrier and the segregation of those who are unable to control their own home conditions in a way to prevent the spread of the disease. We must register many failures in both lines of action."

He further states that an annual physical examination for all people must be encouraged by educational methods and all possible means in order that all tuberculous patients may be discovered. Until such an examination at least once a year becomes a community habit the carriers cannot be detected.

The Health Department must filter out and segregate the ignorant, vicious or indifferent carriers and sufferers who are handicapped because of personal habits or home surroundings.

The control of the positive sputum cases comes first. They cannot safely be permitted to remain in any premises where there is insufficient light and poor ventilation.

The importance of alcohol as a predisposing factor in the causation of tuberculosis must be recognized by the community and every effort brought to bear on its suppression.

The successful result of community control of tuberculosis in certain parts of Australia is cited as an example of what community effort has done toward getting rid of this sanitary disgrace and heavy economic burden.

✻

The Geographical Distribution of Amebiasis.—That "tropical dysentery" of amoebic origin is a "surprisingly widespread infection" not only in the subtropical climates but also in

the north temperate zone of the United States is the conclusion drawn by Dr. A. W. Sanford in an article on the Geographic Distribution of Amebiasis (*Journal of the A. M. A.* Dec. 23, 1916). He found that in the past five years among 5,000 patients examined for parasites, 819 from Canada and the Northern States showed some form of amoeba in their stools—535 showing Entamoeba histolytica, and 284 Entamoeba coli. It was also true that of these 819, the great majority were natives of the states in which they resided, and consequently became infected there. Thus of 5,000 northern patients examined at the clinic in question, 18 per cent. showed amoebiasis of some sort; furthermore the number having stool examinations was less than 5 per cent. of the total number of patients registered at the clinic during the five years in question.

We reproduce below by the courtesy of the *Journal of the American Medical Association* a map showing the geographical distribution of the patients examined at this clinic, showing amoebiasis. It will be noticed that the district around the locality of the clinic (the Mayo Clinic of Rochester, Minn.) appears to show a relative great preponderance of the infection, but this false impression is dispelled when it is considered that 30 per cent. of the registration at the clinic is of patients from Minnesota, and 20 per cent. of patients from Iowa.

Patients developing amebiasis in Northern United States and Canada examined at the Mayo Clinic, 1911–1916: O, Endamoeba histolytica; +, Endamoeba coli.

Two New Periodicals.—We desire to call to our readers' attention the publication of two new journals in the field of public health and medicine, each of which is admirable testimony of the unceasing development of this great field of endeavor.

Mental Hygiene is published quarterly by the National Committee for Mental Hygiene, Inc., 50 Union Square, New York City. In the Foreword in the January number the aim of this publication is given as follows:

"*Mental Hygiene* will aim to present non-technical articles and reports by recognized authorities. It will republish from time to time noteworthy contributions to our knowledge of mental disorders which would otherwise be out of

reach of the general public. It will review important books and it will serve as a medium for the first publication of the results of original investigations undertaken in this field. It is our hope that *Mental Hygiene* will prove equally useful to the highly trained worker in psychiatry or psychology, the physician engaged in preventive medicine, the teacher seeing in education preparation for life, the magistrate concerned not only with the consequences but the causes of the offence before him, the parent seeking knowledge of the mechanisms by which character is built, and the student of social problems desirous of understanding the complex fabric of organized society through knowledge of those factors which mould the mental lives of individual men and women."

The *Journal of Urology* of which Dr. Hugh H. Young, of Johns Hopkins, is editor, published bimonthly by Williams and Wilkins Company, 2419–21, Greenmount Ave., Baltimore, is the other valuable addition to the medical field.

The *Journal of Urology* will be planned along broad lines. As the varied problems of the urinary tract are open from every aspect for discussion, papers from the medical, surgical, chemical and experimental viewpoint will be published. The experimental work discussed will include the chemistry and biochemistry, physics, embryology, anatomy, physiology, pharmacology, bacteriology and pathology of the urinary tract and also of the many organs and functions with which it is so closely related, as for example in nephritis. It will be the policy of the *Journal* to encourage and stimulate original contributions in its domain. Interesting papers of a historical nature will also be presented. The *Journal of Urology* will thus not only serve to record the advances in urological science, both medical and surgical, but it will also serve as an instrument for constantly maintaining and furthering the correlation between this and all the other branches of medicine.

✻

Shellfish Industry.—H. S. Cumming, Washington, D. C. (*Journal American Medical Association*, December 30, 1916), remarks on the importance and the great expansion of the shellfish industry in the United States during the last few decades and the evils that have accompanied it, as well as other evils due to changes in the sanitary conditions owing to modern methods and extension of sewerage disposal. Owing to the activity of the health authorities and the powers granted to the Public Health Service, some of these evils have been remedied and the more obvious dangerous localities abandoned, but, owing to the difficulties of control and inefficiency of state and local organizations, the efforts have been only partially successful. Congress in 1912 passed an act enlarging the work of the Public Health Service, and among other things provided for the study of the pollution of navigable waters. The writer has been director of the study of coastal waters under the Public Health Service, and to properly carry out the investigations a steamer was fitted for laboratory purposes in addition to laboratories on shore. An experimental laboratory with large tanks was established on Fisherman's Island at the entrance to Chesapeake Bay for the purpose of solving problems relative to the pollution of shellfish. Many important facts have already been ascertained, and aid has been given by the different state authorities and from large oyster planters and dealers. The bureau of chemistry has taken up the study of shucking-house and shipping conditions. It was found that shellfish were being shipped from some polluted areas, some of them dangerous. State and federal authorities have been notified, and the former have usually been prompt to take such corrective steps as were afforded by existing laws. At present the great bulk of oysters shipped around the country are from safe grounds, and shucked oysters are opened in fairly sanitary houses, but unfortunately there are still some defects in oysters being taken from a few polluted localities and shucked under insanitary conditions. There is no good reason at the present time as to the purification of oysters grown in moderately polluted waters being rendered safe by transplantation for a sufficient length of time to unpolluted waters, if the state authorities will do their duty, and health authorities should supervise the sanitation of shucking conditions. The determination of the safeness and unsafeness of shellfish areas cannot be left to local or state authorities alone, as they lack, as a rule, the

facilities, nor have they always the entire confidence of other states. As most of the shellfish are consumed in communities away from the source, the problem is properly one for federal investigation in coöperation with the states. Local and state authorities can assist by a careful study of the origin of typhoid fever cases, the collection of data relative thereto, and the reporting of such cases to the Public Health Service. The control of sanitary conditions of shellfish is an important problem, which especially requires the hearty, thorough coöperation of local, state and federal authorities. Without such control, the danger of occasional outbreaks and of isolated cases from infected shellfish will continue, and the industry will decline, while the population will be deprived of a nutritious and delicious food.

Industrial Hygiene and Sanitation.

Munitions and Health.—A great deal has been written lately on the health hazards connected with the munition industry. Great efforts are being made in Great Britain and in this country to combat the *danger from explosives—industry poisons*. Dr. W. G. Hudson of the Du Pont de Nemours Company, discusses the subject in a detailed manner in the *Medical Record* of January 20, 1917. The effects of nitroglycerin upon workmen are popularly known as "powder headaches" and "powder knockout." Physiologically the effect is due to the transformation into nitrite after absorption. Nitroglycerin is surprisingly readily absorbed by the skin. Even shaking hands with a workman or examining the chest of one of them, is sometimes sufficient to cause headache in one not immune to it. A tolerance is soon developed. There are no chronic effects. Nitric acid in the form of "mixed acid" may cause burns by actual contact. By far the largest percentage of serious accidents follow the inhalation of fumes arising from nitric or mixed acid (mixture of nitric and sulphuric acids). The deleterious action of the nitrous fumes upon the human system is entirely due to their local corrosive action. The fumes set up a pulmonary edema; they may set up a lobar pneumonia. Various measures, such as the use of oxygen helmets, may be employed to eliminate the poisonous effect. The nitro-aromatics, to which nitrobenzol and trinitrotoluol belong, exert their toxic action chiefly upon the blood. The toxic effect may result in acute and chronic symptoms. The vapors are far more poisonous than the solid compounds. Among the prophylactic measures are scrupulous cleanliness and efficient ventilation. Frequent diagnostic blood examinations afford another valuable measure. A certain degree of tolerance may be acquired. Aniline compounds act similarly to the nitro-aromatics with the exception that they are not likely to produce a leucocytosis. The symptoms are well known. Cyanosis is marked. A large number of compounds are strong local irritants. There is also danger from the fumes given off in the manufacture of fulminate of mercury.

In Great Britain the matter of T. N. T. (trinitro-toluol) poisoning has become so important that the medical inspector of factories has prepared for the benefit of practitioners a paper on the subject. A short account of the circular may be found in the *Journal of the American Medical Association* of February 10, 1917.

A very exhaustive study of the subject has been made by Dr. Alice Hamilton in an article entitled "Industrial Poisons Used in the Making of Explosives." The article, which is contained in the February issue of the *Monthly Review of the U. S. Bureau of Labor Statistics*, represents a preliminary report of an investigation of forty munition plants in the United States. A full description of the plants together with a consideration of methods of prevention and treatment of the poisoning incident to work in these factories will appear later.

We also desire to call our readers' attention to the article on Munition-Plant Poisons by Mr. Archie Rice, which is appearing in this issue of the JOURNAL on page 273.

Coal-Mine Fatalities in the United States, 1916.—Compiled by Albert H. Fay. The returns received by the Bureau of Mines, Department of the Interior, from the State Mine

Inspectors show that 1916 is a banner year in the low record of coal mine fatalities in the United States. The decrease is about 3 per cent. as compared with 1915, while the production of coal increased about 12 per cent. The number of fatalities reported during the year was 2,225 as compared with 2,269 for 1915. Figures are not yet available showing the actual number of men employed during the year, but on the basis of the number of men employed in 1915 the fatality rate was 3.03 in 1916 as compared with 3.09 per 1,000 men employed in 1915. This is the lowest rate since 1898, when about one-half the number of men were employed.

According to the Geological Survey the estimated production of coal for 1916 was 597,000,000 tons as compared with 531,619,487 tons in 1915, so that the number of tons of coal mined per fatality in 1916 was 269,000 as compared with 234,297 in 1915, and 209,261 in 1914. The production per fatality in 1916 is therefore the greatest in the history of coal mining in the United States.

During 1916, there were 11 mine disasters in each of which 5 or more men were killed, being the same number as in each 1915 and 1914. The number of men killed by these disasters in 1916 was 154, the lowest since 1901, as compared with 262 in 1915, 316 in 1914, and 464 in 1913. The principal net decreases in fatalities for the year are as follows: Falls of roof and coal, 14; gas and dust explosions, 78; explosives 9, surface accidents of all kinds, 12. While in the above causes there was a gratifying decrease shown by reason of the educational work conducted with reference to the study of gas and dust explosions, and the introduction of permissible explosives, there was a net increase of 43 fatalities due to mine cars and locomotives underground, and an increase of 8 in various shaft accidents. As haulage systems necessarily increase in scope as the mines become larger, there should be a concentrated effort on the part of all to reduce the hazards connected with this feature of the mining industry.

Although the net decrease is not large, yet it shows that the efforts exerted by the various agencies whose object is to reduce mine accidents are meeting with success. Among the means employed to reduce accidents may be mentioned the general use of safety lamps in doubtful mines, the introduction of permissible explosives, humidifying dusty mines, first-aid and rescue training which save lives that might otherwise be lost by reason of injuries received, the enactment of industrial accident compensation laws, and the spirit of coöperation on the part of all concerned.

*

Employment during Adolescence in Massachusetts.—If Dr. M. Victor Safford, in his study of male minors working in the cotton mills of Massachusetts, had done nothing else than to point out the need for central authority in the issuance of working certificates, he would have performed a distinct service to the community, but in this study issued by the United States Public Health Service as Bulletin No. 78, "Influence of Occupation on Health During Adolescence," Dr. Safford has shown clearly the value of painstaking work properly directed and carried out in an investigation of this sort. The Bulletin reviews intelligently the Massachusetts laws as they affect the working of minors and gives a brief but comprehensive description of the conditions under which minors work in cotton mills, and the character and kind of work they are called upon to perform.

Doctor Safford finds that the work at which the boys are employed in cotton mills would appear to involve but slight hazards in the way of industrial accidents, and that danger of chemical poisoning can apparently be excluded. The report is accompanied by classified tables of physical development and by standard tables of heights and weights, for purposes of comparison. Doctor Safford puts his finger directly on two most important factors in health conservation when, at the close of his recommendations, he points out that the schools of Massachusetts offer an opportunity to educate parents indirectly in child welfare, and that medical supervision of school children contemplated in existing statutory law of the commonwealth offers the means of preventing directly many of the diseases and defects among young workers.

We wish that it might be given to Doctor Safford to study in detail and to report upon a plan for an organization which would not only "contemplate" but which would actually carry out to the best advantage the real meaning of the Massachusetts laws concerning the medical

supervision of school children, and the teaching of hygiene in the schools. If Doctor Safford's recommendations concerning the issuance of employment certificates were enacted into law (and there is no good reason why they should not be); if school hygiene were given the place its importance deserves, and if medical supervision of school children in Massachusetts were really medical supervision in all the term implies, the industries of Massachusetts and the commonwealth would be far better off because of the enforcement of such legislation.

We recommend the careful perusal of Public Health Bulletin No. 78 to all who are interested in the health of young persons.

*

Industrial Pensions in Sweden.—Regulations for the inauguration of the largest private pension project in the history of Sweden were promulgated, November 19, 1916, at a meeting of the superior board of managers of Swedish industrial associations and various chambers of commerce. (*Commerce Reports*, January, 2, 1917.) Men pay 10 per cent. of their salaries for their own pensions and 6 per cent. for family pensions. Men are eligible to full pensions at 62. Women are entitled to full pension at 57, provided they reach their highest compensation before 38. Membership is compulsory for all employees of concerns who belong to above organization.

*

An Interesting Decision.—(Larke *vs.* John Hancock Mut. Life Ins. Co.). The Supreme Court of Errors of Connecticut affirmed a judgment sustaining an award under the workmen's compensation act in favor of the claimant whose husband had been in the employ of the company soliciting insurance and collecting insurance premiums. Unusual exposure of the man to cold produced lesions of the face and erysipelas set in as a consequence. The man died. The court concluded that the "frostbite" was a personal injury, "arising in the course of and out of his employment." It was held to be immaterial that erysipelas does not ordinarily result from frostbite.

*

The Medical Provisions of the Young Bill in Massachusetts.—Governor McCall of Massachusetts devoted an extensive section of his annual message to Health Insurance, recommending definitely the establishment of a compulsory system of health insurance. Representative Young introduced a bill, which can be studied in detail in the Boston *Medical and Surgical Journal* of February 1, 1917. The Young bill supersedes, of course, entirely the Doten bills discussed in this section on numerous occasions. The general system of medical organization for the care of the sick under the Young bill is the "panel of physicians." Every physician licensed to practice under the laws of Massachusetts may enter the panel of his district by registering with the State Commission. Freedom of choice of physicians by patients is guaranteed. Medical attendance to dependent members of the families of insured persons is included. The Young bill does not limit the panel physician to 1,000 insured persons. The Commission, in the recommendation of the Medical Advisory Board, has the power to lay down the maximum number of patients to be allowed a panel physician. The payment is upon a visitation basis. The State Commission is to consist of five members and is the supreme administrative authority. The Medical Advisory Board consists of eleven members. Provision is made in the Young bill for medical officers who are to pass upon the certificates of disability to work. Provisions for preventive medicine in the bill is made to a greater extent than in any preceding proposal.

*

The Illinois Industrial Board has completed the settlement of fourteen of the eighteen death claims against the Elgin National Watch Company as a result of a recent typhoid epidemic. The epidemic was due to contaminated drinking water furnished employees. The case is of particular importance because it tends to establish the principle that under certain conditions typhoid fever is an occupational disease.

*

Medical Care of Employees.—C. H. Lemon, Milwaukee, Wis. (*Journal A. M. A.*, Jan. 13, 1917), describes the general conditions in industries, especially in the care of employees and their general physical condition, and describes the favorable results obtained by the Milwaukee Electric Railway and Light Co., and its organization of the Employees Mutual Benefit Associa-

tion. He says he has been surprised at the results obtained by insisting under all conditions on the continuance of the preëmployment medical examination of employees, even when candidates were few and at a premium. He says the more difficult it becomes to obtain employment the more desirable that employment will become, and ignoring this fact and letting up on conditions is likely to do damage to the employing company. The details of his article as to the experience of the Milwaukee company are of interest, and the results of the organization of the Employees Mutual Benefit Association are given. They have a savings and loan association, additional life insurance, sick and accident insurance, a provident loan fund, where money can be had without interest, old age pensions, a woman's auxiliary, etc., and all the auxiliaries that go to provide healthful recreation and promote happiness. Once a year, divided into two days of recreation, 12,000 people including employees, their wives and families, have a picnic with a 20-mile trolley ride. They have found that in a large corporation it is possible to have a feeling of intimate relationship, and the medical man, perhaps above all others, comes close to bringing about happy conditions.

✠

According to an opinion given by the Wisconsin Industrial Commission the largest reduction in accidents has been accomplished in establishments in which rank-and-file workmen acted as inspectors. One to three men are appointed in each large department to serve one or two months. The inspection takes place once every week or once every month. These inspectors are in a very good position to interest their fellow workmen and induce them to do their part.—*Factory*, February, 1917.

✠

Effect of the Minimum Wage in Retail Stores in Massachusetts.—The minimum wage decree covering female employees in retail stores became effective on January 14, 1916. According to its provisions no female employee of ordinary ability aged 18 or over, having at least one year's experience, should be paid less than $8.50 a week. Inexperienced girls under 17 should not receive less than $5.00. The decree was very strongly opposed in newspapers and at public hearings. Early in February, 1916, the Minimum Wage Commission investigated the workings of the decree. Of the 16,036 women employed as full-time workers in all the establishments inspected, 93.8 per cent. were receiving not less than the recommended rates. Higher-priced workers did not seem to be affected. The effect of the decree upon women employees seems wholly good. It is possible, however, that it may lead to a reduction of the number employed, the poorer workers being the ones to suffer. There was no evidence to show that extras were being substituted for regular full-time workers.

✠

Behind the Scenes in a Restaurant—A Study of Women Restaurant Employees.—The Consumers' League of New York City has recently undertaken a study of conditions in restaurant work, in which between 15,000 and 20,000 women are employed in New York State. Details of the investigation are available in a special bulletin of the League. The investigation covered a group of 1,017 women and girls in the state. More than two-thirds are foreign born; almost one-third were married; one-fourth were under twenty-one years old. Very objectionable features of the work are the long hours and the nerve-racking character of the work. Only 42 per cent. of the women worked less than 55 hours a week, one-fifth worked over 75 hours, and 5 per cent. over 85 hours weekly. Six women worked over 105 hours weekly.(!) There is no provision for any rest during the day. Wages are about on the same level of those in unskilled industries for women. One-fourth of the group were paid less than $5 a week. Eighty-nine per cent. received less than $9, which has been fixed as the minimum on which a girl can live properly in New York. Even when due allowance is made for tips and meals, thirty-one per cent. received less than $9. To meet this situation regulations are sadly needed.

✠

The National Safety Council of Chicago has a committee of safety experts working out the maximum and minimum requirement in safeguardings. The findings of these experts are contained in the monthly "Safe Practices" leaflets, three of which have already been issued. They pertain to "Ladders"; "Stairs and Stairways"; and "Border Rooms." It is difficult to

see how a modern industrial establishment can afford to overlook the excellent suggestions in the illustrated leaflets. Membership in the Council entitles the holder to additional valuable service. Five bulletins a week are issued to educate workmen and managers. The address of the Council is 208 South La Salle Street, Chicago, Illinois.

✱

The Wellington Act.—The amended form of the Child Labor Law, known as the Wellington Act, which went into effect in New York on February 1, provides that no employment certificates shall be issued unless the applicant has reached the age of 15 years and has completed grade 6B or its equivalent, except that a child who has been graduated from a public school may receive an employment certificate at 14 years. No changes are made in the law in the requirements regarding physical fitness. In its present form the law seems to meet the necessities of the situation in admirable fashion, and its enforcement may be expected to result in great benefit.

✱

In honor of Dr. Charles McIntire, former Secretary of the American Academy of Medicine, the Academy has offered two prizes to be awarded at the annual meetings in 1918 and 1921 respectively. The subject for the 1918 prize is "The Principles Governing the Physician's Confirmation in the Various Forms of Social Insurance," that for the latter prize, "What Effect has Child Labor on the Growth of the Body?" All essays must be in the hands of the secretary of the Academy on or before January 1 of the year in which the prize is to be awarded. Further details may be obtained from the Secretary, Dr. Thomas W. Grayson, 1101 Westinghouse Bldg., Pittsburgh, Pa.

✱

Laundries and the Public Health.—M. C. Schroeder and S. G. Southerland of the New York City Health Department carried on a very instructive study of "Laundries and the Public Health," the results of which are published: Public Health Reports U. S. P. H. Service, Vol. 32, No. 6. The purpose of the study was to ascertain the methods employed in New York City in laundering clothes, with special reference to the efficacy of such methods in destroying pathogenic bacteria and thus preventing the spread of disease. The investigators found that the sanitary conditions existing in the average "hand laundry" managed by white persons are of a very low grade, falling far below those existing in Chinese laundries. The state factory laws concerning living quarters are violated in both Chinese and hand laundries. The use of the "blow can" for dampening clothes is universal in Chinese laundries and may lead to infection. The methods employed in the average "hand laundry" of marking and sorting the clothes are unsuitable and a possible source of danger to the health of the employees and community. The primitive drying facilities employed are not such as would secure the death of all pathogenic germs which may have survived the washing process. The report also criticizes conditions found in the steam laundries. The method at present commonly employed by certain steam laundries of returning "wet" clothes to the patrons and to hand laundries is a possible menace to public health.

✱

Quarry Fatalities on the Decrease.—In spite of the fact that the total number of men reported employed at quarries increased from 87,936 in 1914 to 100,740 in 1915 the number of fatalities dropped from 180 to 148 in 1915. Very detailed statistics on "Quarry Accidents in the United States During the Calendar Year 1915" appear in Technical Paper 165 U. S. Department of Interior, Bureau of Mines. The material is compiled by Albert H. Fay.

Personal Notes.

At the annual meeting of the Federation of the Medical Boards of the United States held recently in Chicago, Dr. Walter L. Bierring of Des Moines, Iowa, was elected secretary-treasurer.

✱

Dr. Edward G. Whipple has resigned as medical director of the Rochester Public Health Association.

✱

Dr. Waldon E. Munz has been appointed assistant bacteriologist of the city of Rochester, N. Y., succeeding Dr. W. L. Culpepper.

✱

Mr. F. M. Harris has been appointed city chemist of Butte, Mont., succeeding Dr. C. E. Easton.

✱

At the annual meeting of the Massachusetts Association of Boards of Health held recently in Boston, the following officers were elected: President, Dr. F. X. Mahoney; vice-presidents, Dr. J. S. Hitchcock and Mr. W. J. Kirshbaum; secretary, Dr. F. H. Slack; treasurer, Dr. F. G. Curtis.

✱

Dr. John S. Billings, who will retire as deputy health commissioner of New York City on May 1 after twenty years' active service, will continue his work in preventive medicine in the capacity of health officer of the stock exchange and of the public library.

✱

Dr. J. H. Pryor has been elected president of the Buffalo Association for the Relief and Control of Tuberculosis.

✱

Dr. J. D. Case has been reappointed state health inspector of the Nebraska State Board of Health, and Dr. W. F. Wild has been reappointed state bacteriologist.

✱

Dr. John G. Smith, of Frankfort, has been reëlected for the fourth consecutive term president of the Kentucky State Board of Health.

✱

Dr. W. H. Robin has been reëlected secretary of the New Orleans Board of Health; Dr. Paul Gilpin, inspector of communicable diseases; and Dr. A. L. Metz, bacteriologist.

At the recent annual elections of the Louisiana State Board of Health, Dr. Oscar Dowling was reëlected president of the Board; additional appointments were made: Dr. J. M. Mosley as vice-president of the Board; Dr. M. W. Swords, secretary; Dr. John H. Ellis was appointed registrar of vital statistics; Dr. H. B. White was retained as medical advisor to the Board, and Miss Agnes Morris was appointed instructor in school hygiene.

✱

Dr. E. T. Briver of Boise has been elected secretary of the Idaho State Board of Health.

✱

Dr. Mortimer W. Raynor has been appointed by the Commissioner of Correction of New York City as Chief-physician-psychiatrist in the penal institutes of that city. The position is only recently created, and the duties include mental examinations of all committed prisoners.

✱

Dr. B. C. Crowell, professor of pathology and bacteriology at the University of the Philippines, has been appointed director of the Graduate School of Tropical Medicine and Public Health of that University. This school gives courses which in one year lead to a degree of Doctor of Tropical Medicine, and in two years to Doctor of Public Health.

✱

Mr. Edward R. Embree, formerly assistant secretary of Yale University, has been appointed secretary of the Rockefeller Foundation to succeed Jerome D. Greene.

✱

At the ninth annual meeting of the National Committee for Mental Hygiene, held February 7, in New York, it was announced that during the past year over $30,000 had been contributed for general expenses by four donors, one of whom had also pledged $100,000 toward an endowment fund. The Rockefeller Foundation had contributed $34,000 for special purposes such as surveys of conditions among the insane and feeble-minded. These surveys have been completed in California, Colorado, Connecticut, Georgia, Louisiana, Pennsylvania, South Carolina, Tennessee, Texas and Wisconsin, and are

now in progress in Chicago and New York. Sixteen state societies for mental hygiene have been organized. The initial issue of the quarterly organ, the *Journal of Mental Hygiene*, appeared in January. The following officers were elected: president, Dr. Lewellys F. Barker, Baltimore; vice-presidents, Prof. Charles W. Eliot, Boston, and Dr. William H. Welch, Baltimore; treasurer, Mr. Otto T. Bannard; medical director, Dr. Thomas W. Salmon, New York; associate medical director, Dr. Frankwood E. Williams, Boston, and secretary, Mr. Clifford W. Beers.—*Exchange.*

✻

A new form of welfare work will be instituted by the General Electric Company at its Schenectady plant. Its object is to supervise education, employment and provision of opportunities for advancement of employees. This industrial service department is under the management of Mr. E. B. Merriam.

✻

Surgeon Joseph W. Schereschewsky, U. S. P. H. S., has been investigating health conditions of steel workers in Pittsburgh to provide the government with information for minimum standards of industrial hygiene.

The following persons were elected for membership in the American Public Health Association, February 7, 1917:

Lawrence P. Geer, B. S., Berlin, N. H., Health Officer.

M. Gorman Prince, Hobart, N. Y., Bacteriologist.

Edw. R. Perry, M. D., Raymond, Wash., Health Officer.

Sherwood J. Larnard, Chicago, Ill., Asst. Gen. Mgr., Chicago Telephone Co.

Mr. Wm. A. Hadfield, Madison, Wis., Bacteriological Chemist.

Claude P. Fryer, M. D., New Orleans, La., Candidate for degree of D. P. H.

Wm. S. Sadler, M. D., Chicago, Ill., Physician and Surgeon.

J. Walter Ramsdell, Detroit, Mich., Director the Hygienic Lab., Ford Motor Co.

H. R. Lee, M. S., Decatur, Ill., Chemist.

Miss Winifred Stuart Gibbs, New York City, Lecturer in Household Arts, Teachers College, Columbia University.

Eugene C. Howe, Wellesley, Mass., Dept. of Hygiene, Wellesley College.

Alfred J. Mahnken, C. E., Weehawken, N. J., Civil Engineer, New York.

Current Public Health Literature.

Albany Medical Annals.

XXXVIII. February.

The Problem of the Social Adjustment of the Unusual Child. F. H. Knight.
The Backward Child—What Can Be Done for Him. J. T. Krause.
A New Field of Research—Alcohol. T. D. Crothers.
The Medical Administration of Health Insurance. E. A. Stapleton.

American City, New York.

XVI. February.

Some Problems of the Water-works Executive. G. O. House.
City Planning and Political Areas. G. E. Hooker.
Motion Pictures and Local Responsibility. Cranston Brenton.
The Comfort Station as a Public Utility. J. J. Coegrove.

American Food Journal, Chicago.

12. February.

Food Standards—A Symposium.
Food Manufacture and the Law. T. E. Lannen and T. J. Hickley.
The Manufacture of Butter and Margarine. By the Editor.
Laboratory Control of Edible Fats. H. V. Cadwell.
Fats and Their Economical Use in the Home. A. D. Holmes and H. L. Lang.
Pasteurisation. Adolph Gehrmann.

American Journal of Nursing, Baltimore.

XVII. February.

What Social Insurance Will Mean to Nurses. Martha M. Russell.
Civil Service Examination for Nurses. Jane E. Hitchcock.
Relation of the Nurse to Mouth Hygiene. J. W. Beach.

Boston Medical and Surgical Journal.

CLXXVI. February 1.

A Laboratory Aid in the Diagnosis of Scarlet Fever. D. M. Lewis.

February 8.

Possibilities in Social Service for Psychopathic Patients. Mary S. Jarrett.
Inebriety from a Medical Standpoint. I. H. Neff.
The Framingham Health and Tuberculosis Demonstration. D. B. Armstrong.
The Drug Treatment of Morphinism. F. H. Carlisle.

February 15.

Chronic Carbon Monoxide Inhalation and Some of Its Untoward Results. W. J. McGurn.
The Epidemiology of Anterior Poliomyelitis Epidemica, 1916. D. M. Lewis.
Medical Services and Hospital Fees under Workmen's Compensation. F. D. Donoghue.
Physical Examination and Medical Supervision of Factory Employees. W. I. Clark.
The Fallacious Social Philosophy of Health Insurance. F. F. Dresser.

Factory, New York.

XVIII. February.

Keeping in Touch with John and Jim. How Sixty-three Factory Managers Retain Contact with Their Men. Wm. Cordes.
Putting a Milk Man on the Payroll.
Knowing What Accidents Cost. R. W. E. Sizer.
Proof That It Pays to Ventilate. C.-E. A. Winslow.

Industrial Management, New York.

LII. February.

Hiring the Worker. R. W. Kelly.
Labor after the War. L. R. Freeman.

Journal of the American Medical Association, Chicago.

LXVIII. January 27.

Health Insurance and the Medical Profession. A. Lambert.
Observations on Immunity of Monkeys to Experimental Poliomyelitis. E. C. Rosenow, E. B. Towne, G. W. Wheeler.

February 3.

Results of Research on Conditions Affecting Posture. H. L. Taylor.
Conceptions and Misconceptions in Psychoanalysis. T. Burrow.
Group Study: A Report of 150 Cases. W. W. Behlow.
Treatment of Gonorrheal Infections by the Intravenous Injection of Killed Gonococci, Meningococci and Colon Bacilli. H. Culver.

February 10.

The After-Care of Poliomyelitis as a Public Problem. R. W. Lovett.
Bacterial Findings and Their Relation to Pyorrhea Alveolaris and Interstitial Gingivitis. A. W. Lescohier.
Physicochemistry of the Gonococcus in Relation to Immunity and Therapeusis. C. C. Warden.

Journal of the Florida Medical Association, St. Augustine.

III. January.

The Practical Policy. Oscar Dowling.
The Practicing Physician's Responsibility in Public Health Work. C. P. Knight.
Some of the Recent Ideas on Infantile Paralysis. J. H. Fellows.

Journal of Infectious Diseases, Chicago.

20. February.

Virulence of Diphtheria Bacilli from Diphtheria Patients and Diphtheria Carriers. G. H. Weaver.
The Alleged Detoxicating Power of the Thyroid Gland. H. R. Basinger.
An Epidemic of Acute Diarrhea Approaching in some Cases a Mild Dysentery. W. Sadler and R. F. Kelso.
The Passive Transference of Non-Specific Antibodies. P. K. Olitsky and D. S. Dinzer.
Comparative Study of Bacillus Anthracis-symptomatici and Allied Organisms with Respect to Gas Production. L. C. Todd.
Transmission of Pneumonic and Septicemic Plague among Marmots. F. Emerson and Wu Lien Teh.
Plague Poisons and Virulence. F. Emerson.
Effect of Various Chemical Substances on the Haemolytic Reaction. N. P. Sherwood.
Blood-culture Studies on Typhus Exanthematicus in Serbia, Bulgaria, and Russia. G. Baehe and H. Plotz.
Leukopenia and Leucocytosis in Rabbits. C. W. Wells.

Journal of Laboratory and Clinical Medicine, St. Louis.

III. January.

Application of Typhoidin Test in a Group of Nurses and Physicians. F. P. Gay.
Study of the Occurrence of Immature Polynuclear Leucocytes in the Circulating Blood in Pulmonary Tuberculosis and Other Infectious Diseases. A. M. Burgess.
A Simple Method of Plotting Charts. J. R. Williams.
Macrophages in Feces in Acute Dysentery. K. M. Lynch.
A Further Study of the Pathological Effects of Atmospheres Rich in Oxygen. H. T. Karsner and J. E. Ash.
Demonstration of Treponema Pallidum in the Cerebral Cortex of a Congenital Syphilitic Child. C. E. Keily.
A Machine for Shaking Blood Mixing Pipettes. G. G. Little.
Further Notes on a Modification of the Nogouchi Test. N. E. Williamson.

February.

Apparatus for Use in Examining Feces for Evidences of Parasitism. M. C. Hall.
Complement Fixation in Tuberculosis. G. B. Webb.
The So-Called Much-Weiss Tubercle Granules. G. B. Webb.

Journal of Outdoor Life, New York.

XIV. February.

House Infection and the Spread of Tuberculosis. S. H. Stone.
Results of Twelve Months of Field Work in County Tuberculosis Surveys in Michigan. Arnold Mulder.
The Patent Medicine Evil. P. K. Brown.

Journal of the National Dental Association, Huntington, Ind.

IV. February.

Oral Hygiene and Its Relation to Public and Individual Health. O. W. King.
Prophylaxis for Pyorrhea. P. R. Stillman.

Journal of the South Carolina Medical Association, Greenville.

XIII. January.

Necessity of Graphic Illustration of Sanitary Conditions in a Community. M. R. Mobley.
The Need and How to Obtain a Hospital in Every County in South Carolina. L. H. Jennings.

Medical Record, New York.

91. January 27.

Paratyphoid as Observed during an Epidemic in the 14th N. Y. Infantry while on U. S. Service at the Mexican Border. C. W. Berry.
A Study of Mental Retardation in Relation to Etiology. B. T. Baldwin.
Modified Method in Tuberculin Therapy. W. Meyer.

February 3.

Modern Diagnosis and Treatment of Syphilis. F. W. Smith.
Bacteriological and Experimental Researches on the Etiology of Sprue. H. Dold.

February 10.

Tuberculin Actions and Reactions. P. H. Ringer.
Effective Localization of the Streptococci from the Autotherapeutic Point of View. C. H. Duncan.

February 17.

Psychiatry and Psychology. C. L. Dana.
Birth Control: What Shall Be the Attitude of the Medical Profession toward the Present Day Propaganda. G. W. Kosmak.

Medical Times, New York.

XLV. February.

Feeble-mindedness and the Law from a Medical Viewpoint. T. W. Salmon.
Pediatric Review with Infant Feeding as Practiced During the Last Twenty Years. Louis Fischer.

Mental Hygiene, New York

I. January

The Wider Field of Work of the National Committee for Mental Hygiene. L. F. Barker.
Underlying Concepts in Mental Hygiene. W. A. White.
Unemployment and Personality. H. M. Alder.
The Insane in a County Poor Farm. T. W. Salmon.
The Growth of Provision for the Feeble-minded in the United States. W. E. Fernald.
Mental Adaptation. F. L. Wells.
Organized Work in Mental Hygiene. C. W. Biers.
What Hospitals for Mental Diseases Can Do in Mental Hygiene. W. L. Russell.
The Sub-Normal Child—A Study of the Children in a Baltimore School District. C. MacFie Campbell.

Modern Hospital, St. Louis.

VIII. February.

Work of the Detroit Receiving Hospital. J. Dretzka.
Hospital Survey of a Community. J. J. Weber.
Small Community Hospital That Meets a Need. S. A. Lutgen.
Sociological Aspect of the Treatment of Alcoholism. C. B. Towns.
Emergency Hospitals for Industrial Plants. L. L. Watters.
The Small Community Hospital—The Organization. J. A. Hornsby.

Municipal Engineering, New York.

LII. February.

Brick Sewers. J. F. Springer.
Collection and Incineration of Garbage in Sewickley, Pa. E. E. Duff.
Alcohol from Garbage.

Municipal Journal, New York.

XLII. February 8.

How Sewage Plants are Operated.
Test for Chlorine in Water. F. E. Daniels.

February 15.

Wappingers Falls Water Supply. H. W. Taylor.
Water Supply of Parkersburg.

National Municipal Review, Philadelphia.

VI. January.

Municipal Preparedness. C. R. Woodruff.
Some Advance Municipal Steps. Lawson Purdy.
Evolution of Types of City Government in the United States. H. L. McBain.
Public Regulation of Wages, Hours, and Conditions of Labor of the Employees of Public Service Corporations. D. F. Wilcox.
Municipal Recreation—A Review of Recent Literature. G. A. Bellamy.
How Not to Plan Cities. J. H. McFarland.

New York Medical Journal.

CV. January 27.

Influenza vs. Tuberculosis. B. Frankel.
Mercurialized Serum and Bichloride of Mercury. P. S. Pittenger.
Supplementary Dietary Relationships among our Natural Food Stuffs. E. V. McCollum.
Consideration of Some Matters Relating to Diet. C. Bartlett.

February 10.

The Rights of the Unborn Child. B. C. Hirst.
The Vicious Circle in Oral Sepsis. N. B. Potter.
Birth Control. E. C. Podvin.

February 17.

Male Impotence and Sterility in Marriage. B. S. Talmey.
Don'ts in the After-care and Treatment of Infantile Paralysis. C. Ogilvy.
Research in Epilepsy. H. A. Knox.

New York State Journal of Medicine

17. February.

Effect of Malformation and Infection of the Oral Cavity of the Child Upon Its Future Health. S. Palmer.
Economic Disadvantages of Compulsory Health Insurance. N. G. Curtis.
Comment on Arguments of Mr. W. G. Curtis. S. J. Kopetzky.
Need for Health Insurance. Irving Fisher.
Industrial versus Private Medical Practice. G. L. Howe.

New Orleans Medical and Surgical Journal.

69. February.

Epidemic of Dengue in Porto Rico, 1915. W. W. King.

Public Health Journal, Toronto.

VIII. January.

Principles Involved in Notification of Tuberculosis. P. H. Bryce.
Sanitation of Railway Cars. T. R. Crowder.
Causation of Dental Decay. Florence Withrow.
War and the Incidence of Insanity. Wm. Graham.

Safety Engineering, New York.

XXXIII. January.

Sight-Saving in the Industries.
Logging Accidents in Wisconsin.
Evidence as to Alcohol. N. C. Harte.
Training Pupils in the Spirit of "Safety-First." C. F. Pepper.
Suction System for Grinding Rooms.
Safety Standards for Cranes.

Social Service Review, Washington, D. C.

IV. January.

Who Demands the Production of Vulgar Salacious Scenes in Motion Pictures?
A New Slogan for Motion Picture Patrons. Your Problem and Mine; What Shall We Do to Combat the Growing Evil of the Immoral Motion Picture Drama?
Where Does the Responsibility Lie? Mary G. Peck.
Helping the Employee to Grow. E. Piper.
Our Responsibility to the Boy Who Works. F. H. Rindge.

Southern Hospital Record, Atlanta.

3. January.

Pellagra. Vena M. Woods.
How Public Health Nurses Can Aid a State Department of Health to Extend Its Program of Health Conservation. R. G. Patterson.

Southern Medical Journal, Birmingham.

X. February.

The Relation of the Medical Profession to Medical Preparedness. R. E. Noble.
A Simplified Technique in the Application of Schick's Reaction for Testing Immunity to Diphtheria. Wm. Litterer.
Report of the Committee on Uniformity in the Wassermann Reaction.
The Evolution Underway in Public Health Activities. J. A. Ferrell.
Importance of the Control of Childhood Infection in the Crusade for the Eradication of Tuberculosis. C. L. Minor.
Trachoma. John McMullen

Survey, New York

XXXVII. January 27.

Involuntary Servitude and the Right to Strike. J. A. Fitch.
Turning off the Spigot III. What Grandfather and Father Thought about Drink. Elizabeth Tilton.

February 3.

In Lincoln's Home. How the Springfield Survey Went About Getting Results. S. M. Harrison.
To Mothers Who Must Be Educated. Alice B. Munroe.
Prostitutes and Tuberculosis. Alice Hamilton.
Do Wages Buy Health? Mary D. Hopkins.
The Children's Bit in the War. W. D. Lane.

February 17.

Twenty-five Years of the Boston South End House. G. Hodges.
Cotton Pickers in the Northern Cities. Helen B. Pendleton.

United States Naval Medical Bulletin, Washington, D. C.

XI. January.

The Prevention of Venereal Diseases at the Naval Training Station, Norfolk, Va. C. E. Riggs.
The Complement Fixation Reaction on Board Ship. W. W. Cress.
The Syphilis Record. C. F. Cottle.
Hookworm Infection in Cuba. R. Spear.
A Preliminary Report on the Pathology of Narcotic Addiction. C. F. Stokes.

United States Public Health Reports, Washington, D. C.

32. January 26.

Control of Pollution of Streams—The International Joint Commission and the Pollution of Boundary Waters. Earl B. Phelps.

February 2.

Typhus Fever—Measures for the Prevention of Its Introduction at El Paso, Tex.
Interstate Sanitary Regulations. W. C. Rucker.

February 9.

Laundries and the Public Health—A Sanitary Study, Including Bacteriological Tests. M. C. Schroeder and S. G. Southerland.

February 16.

Commission on Milk Standards—Third Report of the Commission on Milk Standards Appointed by the New York Milk Committee.

BRITISH.

Journal of State Medicine, London,

XXV. January.

The Harben Lectures. Lecture III. By Alex. C. Houston. Physical and Bacteriological Changes Occurring in River Water under Conditions of Storage; Treatment of Algal-Affected Waters; Taste of Algal-Affected Waters; Thames-derived Filtered Waters; Water and Disease.
The Requirements of the Meningococcus in Culture. A. H. Drew.

Lancet, London.

CXCII. January 6.

Conditions Which Govern the Growth of Bacillus of "Gas Gangrene" in Artificial Media and in the Body Fluids *in vitro*, and in the Dead and Living Organism. A. E. Wright.
History of Six Cases of Amoeba Histolytica Carriers Treated with Emetine Bismuthous Iodide. C. G. Imbiere.
Surface Tension and the Wassermann Reaction. V. B. Nesfield.

January 13.

The Mechanism of Serum Reaction. H. R. Dean.
The State Octopus and the Medical Profession. Edmund Cautley.
Cases of Cerebro Spinal Fever in the Royal Navy. H. D. Rolleston.

January 27.

An Analysis of Recent Cases of Tetanus in the British Expeditionary Force with Special Reference to Their Treatment with Antitoxin. W. B. Leishman and A. B. Smallman.
Modified Tetanus. H. Burrows.
Weil's Disease (Spirochaetosis Ictero-haemorrhagica) in the British Army in Flanders. A. Stokes, J. A. Ryle, W. H. Tytler.
Toxic Jaundice in Munition Workers. M. J. Stewart.

Medical Officer, London.

XV. January 20.

The Increasing Disregard of Vaccination. Mathew Hay.
Quality Grades for Milk Supplies. J. F. Anderson.

January 27.

Restriction of Milk Delivery.
Supervision of Tuberculosis Contacts. G. B. Charnock

BOOKS AND REPORTS RECEIVED.

Poverty and Its Vicious Circles. *By Jamieson B. Hurry, M. D. J. & A. Churchill. London; P. Blakiston's Son & Co., Philadelphia. 1917. Pp. 167. Price, 5/, $2.00 net.*

Microbiology. *Edited by Charles E. Marshall. 2nd Edition. P. Blakiston's Son & Co. 1917. Pp. 861. Cloth, $3.00 net.*

Clinical and Laboratory Technique. *By H. L. McNeil. C. V. Mosly Co., St. Louis. 1916. Pp. 84. Illus. Price, $1.00.*

Practical Uranalyses. *By B. G. R. Williams. C. V. Mosby Co. 1916. Pp. 139. Illus. Price $1.00 net.*

Health and Disease—Their Determining Factors. *By Roger I. Lee, M. D. Little, Browne & Co., Boston. 1917. Pp. 257. $1.75 net.*

Annual Report of the Massachusetts Civic League for the year ending October 31, 1916.

Annual Report of the Oregon State Board of Health for year ending December 31, 1915.

The Public Health Committee of the New York Academy of Medicine—*A Survey of Its Activities during five years of work, 1911–1916.*

Report of the Philippine Health Service, January 1–December 31, 1915. *J. D. Long, M. D., Director of Health.*

Is Mosquito or Man the Winter Carrier of Malaria Organisms? *By M. Bruin Mitzmann. Public Health Bulletin No. 84, December 31, 1916.*

Convict Labor for Road Work. *By J. E. Pennybacker, H. S. Fairbanks, and Dr. W. F. Draper. Bulletin No. 414, U. S. Department of Agriculture.*

Report of the Milk Committee of the Oranges, July, 1914, to December 31, 1915.

California Pure Foods and Drugs Acts, Food Sanitation Acts, Cold Storage Act, with Rules and Regulations, 1916.

Quarry Accidents in the United States for 1915. *Technical paper 165. Department of the Interior, Bureau of Mines.*

Federal Responsibility in the Solution of the Habit-Forming Drug Problem. *By Charles B. Towns.*

Metal Mine Accidents in the United States during the Calendar Year of 1915. *Compiled by A. H. Fay. Technical paper 168. Department of the Interior.*

Separation and Identification of Food-coloring Substances. *By W. E. Mathewson, U. S. Department of Agriculture.*

Supreme Court of the United States. *October term, 1915. No. 235. The Hutchinson Ice Cream Co. et al.; plaintiffs in error vs. the State of Iowa. Brief on the History and the Present Meaning of the term Ice Cream. Compiled by C. G. Child.*

Fourth Annual Report of the Institute of Public Health of London, Canada, 1915–1916.

Medical Lib
APR 20 1917
UNIV. OF MICH.

Vol. VII. APRIL, 1917. No. 4.